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Rio Blanco Oil Shale Company

Tract C-a

Colorado Mined Land Reclamation

Regular Mining Permit Amendment

LURGI DEMONSTRATION PROJECT

December 1980

Gulf Oil Corporation/Standard Oil Company (Indiana)
'A General Partnership'
2851 South Parker Road, Aurora, Colorado 80014

810038

N 238,000
N 233,000
N 228,000
236,204 N
161,855 E
235,996 N
163,161 E
233,628 N
159,176 E
234,880 N
161,805 E
234,664 N
163,113 E
234,478 N
164,421 E
TOPSOIL PILE
RBOSC PRIVATE
PROPERTY BOUNDARY
PHASE II
P/S
PHASE I P/S
233,852 N
159,123 E
233,497 N
161,761 E
233,331 N
163,065 E
233,165 N
164,370 E
PONO No. 13
TOPSOIL PILE
SUBSOIL PILE
SLURRY
PONO No. 7
PONO No. 15
232,438 N
159,070 E
232,398 N
159,492 E
SHALE
PILE
POND No. 16
TRAIL ROAD
232,046 N
161,713 E
231,945 N
163,013 E
232,242 N
160,392 E
PONO No. 14
LURGI SITE
231,844 N
164,317 E
TRACT C-a PROPERTY BOUNDARY
230,824 N
160,340 E
230,820.24 N
160,341.30 E
POND NO 10
POND No. 9
OIL
SHALE
STOCKPILE
PONO No. 8
FLARE
CU 10
CU 9
PIT WATER
TREATMENT
LAGOONS
PONDS
TOPSOIL
PONO No. 12
CU 14
TOPSOIL PILE
POND No. 4
POND No. 2
PONO No. 3
CU 2
CU 1
PIT
DRYCREEK DIVERSION
FACILITIES AREA
CU 3
POND No. 6
LURGI
UTILITY
CORRIDOR
LURGI
ACCESS
ROAD
CU 11
SHOP/OFFICE ACCESS ROAD
CU 12
CU 15
WATER
TREATMENT
PLANT
POND No. 5
CU 5
CU 6
CU 7
CU 13
CU 8
PONO NO 11
TOP SOIL PILE
PONO No. 1
CU 16
TOPSOIL PILE
M.I.S. / PIT
CORRIDOR
EAST GULCH FILL
PROJECT SITE
PRODUCTION
SERVICE SHAFT
ORE
PILE
EXISTING ACCESS ROAD
POWDER
MAGAZINE

PROJECT SITE

PRODUCTION SERVICE SHAFT

ORE PILE

EXISTING ACCESS ROAD

SCRUBBER PONDS

WATER TANK

PROPOSE PUBLIC ACCESS ROAD RELOCATION

N 223000

N 216,000

E 146,000

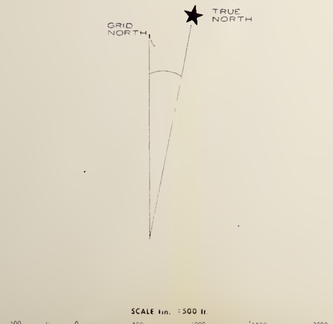
E 150,000

E 156,000

E 162,000

E 166,000

SHEET LAYOUT



LEGEND

- HORIZONTAL & VERTICAL CONTROL
- VERTICAL CONTROL
- HORIZONTAL CONTROL
- DRILL HOLE
- PC PROPERTY CORNER
- PICTURE CENTER
- SECTION CORNER
- 1/4 CORNER
- SPOT ELEVATION
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- CONTOUR THRU HEAVY VEGETATION
- DEPRESSION
- PERENNIAL STREAM
- INTERMITTENT STREAM
- DITCH
- POND
- WASH
- CULTIVATION
- GRADED ROAD
- DIRT ROAD
- JEEP TRAIL
- TRAIL
- CULVERT
- FENCE
- FENCE (POSSIBLE)
- GATE
- CORRAL
- PIPE LINE
- BUILDING
- FOUNDATION
- EARTH DAM
- UTILITY POLE
- TREES
- SCATTERED TREES
- DITCH
- PIPELINE CORRIDOR
- DISCHARGE POINT
- DEWATERING WELLS

REVISIONS			
NO.	DESCRIPTION	DATE	BY

Rio Blanco Oil Shale Company
Rio Blanco County, Colorado

WATER RESOURCE SYSTEMS

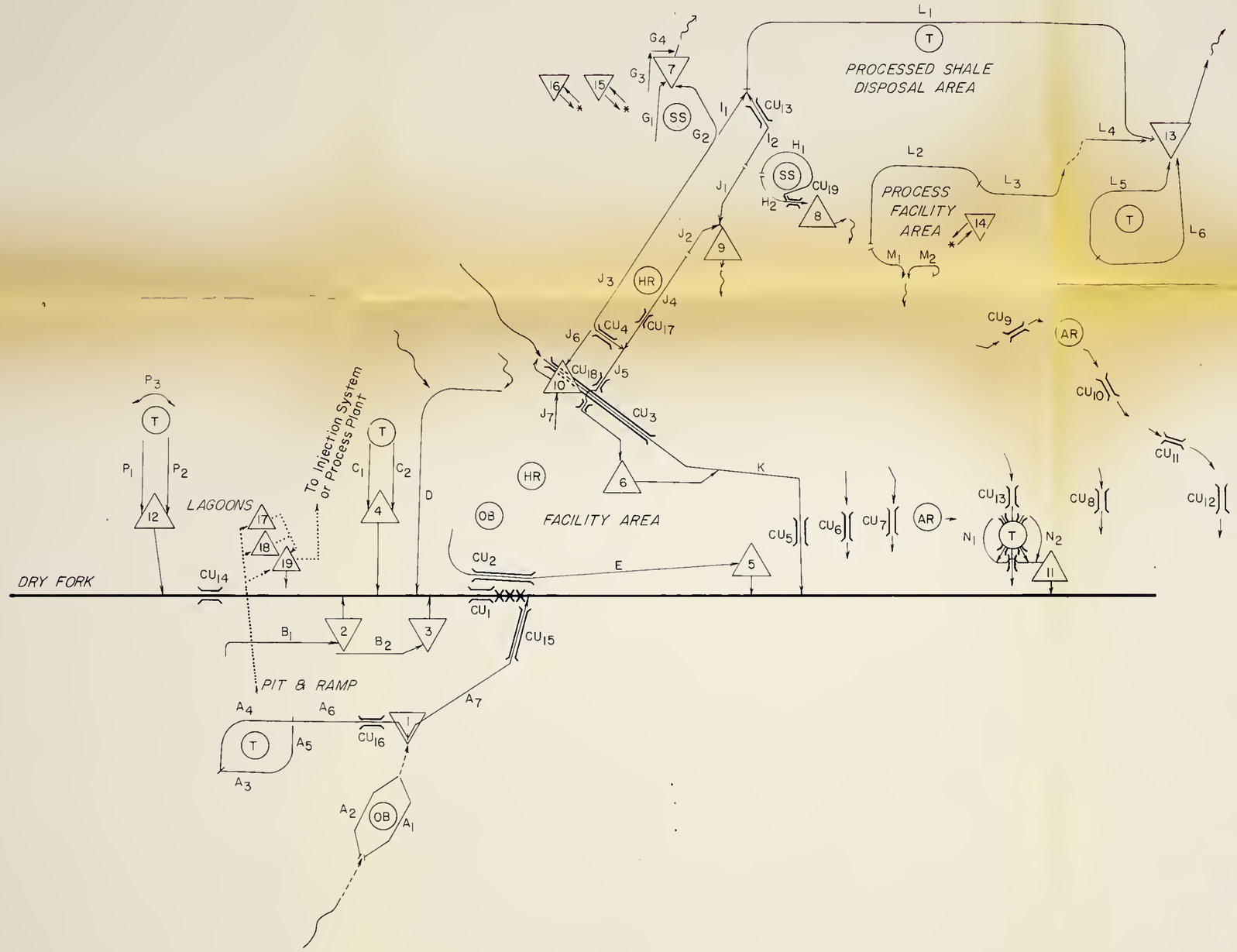
Drawn By: T.N.	Scale: 1"=500'	Exhibit: G-1
Design By:	Date: DECEMBER, 1980	
Approved By:	Drawing No:	

MORRISON-KNUDSEN CO., INC.

TOPOGRAPHIC MAPPING
OF
TRACT C-a
FEDERAL OIL SHALE LEASE NO. C-20046
AND PORTIONS OF
TOWNSHIPS 1&2 SOUTH,
RANGES 98, 99&100 WEST
RIO BLANCO COUNTY, COLORADO

NOTE: COMPILED BY PHOTOGRAMMETRIC METHODS FROM 1:12,000 PHOTOGRAPHY OBTAINED JUNE 1974 WITH AN RC 8 CAMERA OF 152.74mm FOCAL LENGTH. HORIZONTAL CONTROL SURVEYS REFERRED TO THE COLORADO STATE PLANE COORDINATE SYSTEM, NORTH ZONE MODIFIED TO A 7200 FT. DATUM. LAMBERT CONFORMAL CONIC PROJECTION. VERTICAL CONTROL SURVEYS RELATED TO MEAN SEA LEVEL.

SHEET ___ OF ___



LEGEND

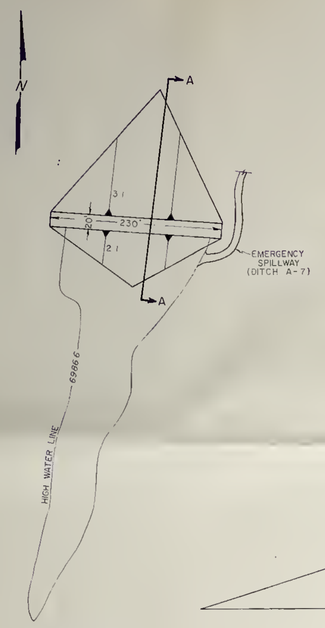
- DITCH
- NATURAL WATERCOURSE
- XXX CHANNEL DIVERSION
- 7 POND
- CULVERT
- T TOPSOIL STOCKPILE
- OB OVERBURDEN PILE
- HR HAUL ROAD
- AR ACCESS ROAD
- SS SHALE STOCKPILE
- ..... PIPING

RIO BLANCO OIL SHALE CO.
DENVER, COLORADO

LURGI DEMONSTRATION PROJECT
WATER CONTROL SYSTEM SCHEMATIC

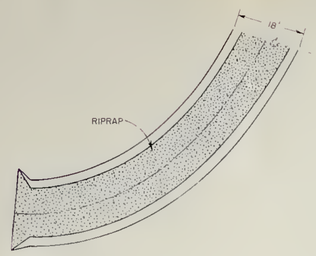
DRAWN BY ND	DATE	SCALE NONE	EXHIBIT No G-2
APP'D BY		DATE DECEMBER, 1980	
DESIGN BY J.P.O'H.	DATE	DWG. No.	
APP'D BY			

MORRISON - KNUDSEN CO., INC.



PLAN VIEW

NOT TO SCALE



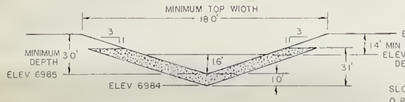
EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

STAGE	VOLUME ac/ft
6951	0
6960	0.329
6970	2.349
6980	8.478
6981	9.511
6982	10.544
6983	11.578
6984	12.611
6985	13.644
6986	15.05
6987	16.45
6988	17.86
6989	19.26
6990	20.67

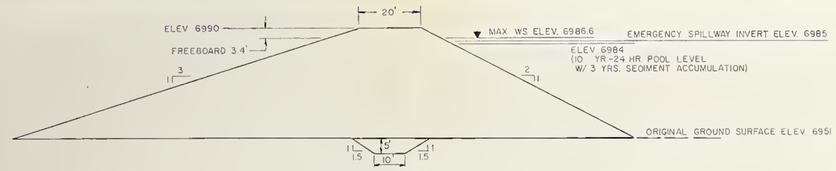
STAGE	DISCHARGE cfs
0	0
0.1	0.02
0.2	0.12
0.3	0.35
0.4	0.75
0.5	1.36
0.6	2.22
0.7	3.34
0.8	4.77
0.9	6.54
1.0	8.66
1.1	11.17
1.2	14.08
1.3	17.43
1.4	21.24
1.5	25.53
1.6	30.3
1.7	35.7
1.8	41.52
1.9	47.96
2.0	55.0



SLOPE = 0.0125 ft/ft
Q PEAK = 291 cfs (100 yr-24 hr.)
VELOCITY = 4.0 ft/sec

EMERGENCY SPILLWAY CROSS-SECTION

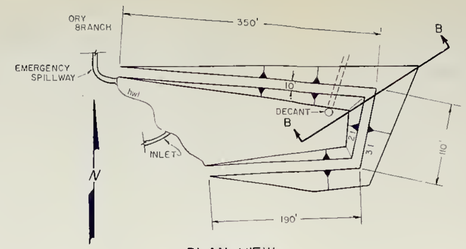
NOT TO SCALE



CROSS-SECTION A-A

NOT TO SCALE

CONSTRUCTION DETAILS - POND 1



PLAN VIEW

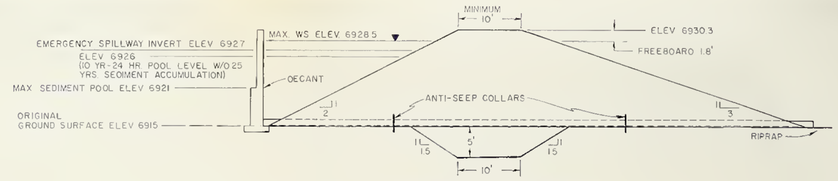
NOT TO SCALE

SEE DETAIL I SHEET 5 FOR TYPICAL DECANT DESIGN

SLOPE = 0.0375 ft/ft
Q PEAK = 17.7 cfs (25 yr.-24 hr.)
VELOCITY = 2.7 ft/sec

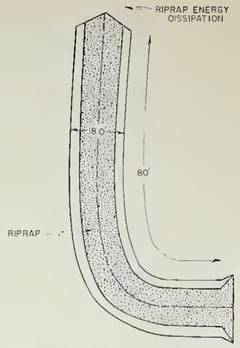
EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE



CROSS-SECTION B-B

NOT TO SCALE



EMERGENCY SPILLWAY PLAN VIEW

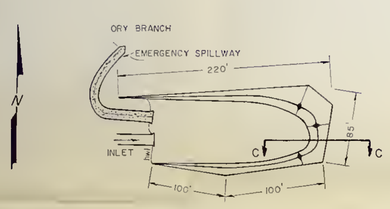
NOT TO SCALE

SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

STAGE	VOLUME ac/ft
6915	0
6916	0.110
6917	0.220
6918	0.330
6919	0.440
6920	0.550
6921	0.936
6922	1.321
6923	1.707
6924	2.092
6925	2.178
6926	3.303
6927	4.129
6928	4.954
6929	5.780
6930	6.605

STAGE	DISCHARGE cfs
0	0
0.1	0.01
0.2	0.08
0.3	0.25
0.4	0.54
0.5	0.97
0.6	1.6
0.7	2.4
0.8	3.4
0.9	4.7
1.0	6.2
1.1	7.9
1.2	10.0
1.3	12.4
1.4	15.2
1.5	18.2
1.6	21.6
1.7	25.4
1.8	29.6
1.9	34.2
2.0	39.2

CONSTRUCTION DETAILS - POND 2

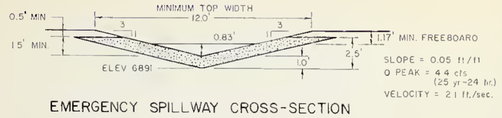


PLAN VIEW

NOT TO SCALE

STAGE	VOLUME ac/ft
6885	0
6886	0.087
6887	0.175
6888	0.262
6889	0.349
6890	0.436
6891	0.730
6892	1.023
6893	1.317
6894	1.610
6895	1.904

STAGE	DISCHARGE cfs
0	0
0.1	0.01
0.2	0.1
0.3	0.3
0.4	0.6
0.5	1.1
0.6	1.7
0.7	2.7
0.8	3.9
0.9	5.4
1.0	7.1

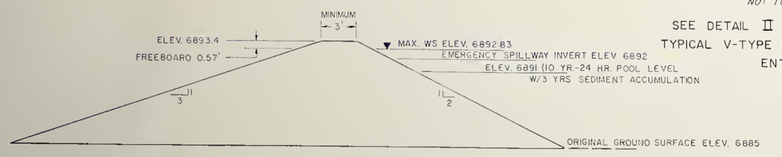


SLOPE = 0.05 ft/ft
Q PEAK = 4.4 cfs (25 yr-24 hr.)
VELOCITY = 2.1 ft./sec.

EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

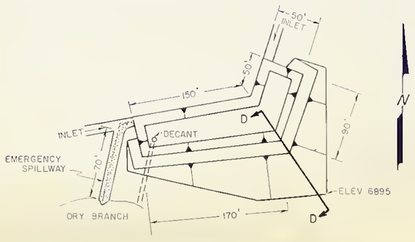
SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE



CROSS-SECTION C-C

NOT TO SCALE

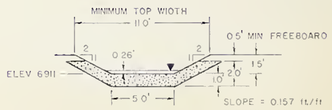
CONSTRUCTION DETAILS - POND 3



PLAN VIEW

NOT TO SCALE

SEE DETAIL SHEET FOR TYPICAL DECANT DESIGN



SLOPE = 0.157 ft/ft
Q PEAK = 3.6 cfs (25 yr-24 hr.)
VELOCITY = 2.3 ft/sec

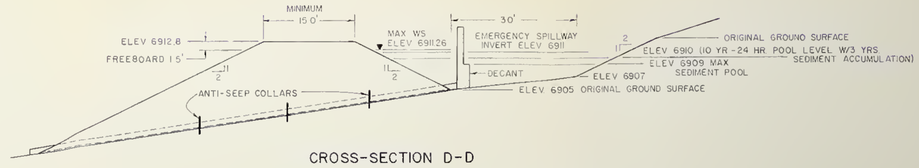
EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

SEE DETAIL III SHEET 5 FOR TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE

STAGE	VOLUME ac/ft
6897	0
6898	0.101
6899	0.202
6900	0.303
6901	0.601
6902	0.900
6903	1.198
6904	1.447
6905	1.795
6906	2.227
6907	2.658
6908	3.090
6909	3.521
6910	3.953

STAGE	DISCHARGE cfs
0	0
0.1	0.75
0.2	2.4
0.3	4.8
0.4	7.85
0.5	11.5



CROSS-SECTION D-D

NOT TO SCALE

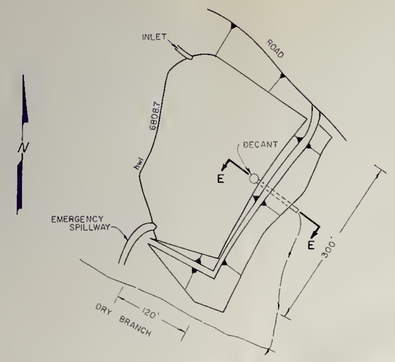
CONSTRUCTION DETAILS - POND 4

RIO BLANCO OIL SHALE CO.
DENVER, COLORADO

CONSTRUCTION DETAILS
PONDS 1, 2, 3 & 4
SHEET 1 OF 5

DRAWN BY ND	DATE	SCALE AS SHOWN	EXHIBIT No. G-3
APP'D BY		DATE DECEMBER, 1980	
DESIGN BY J.P.O.H	DATE	DWG No.	
APP'D BY			

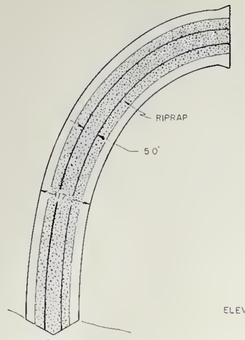
MORRISON - KNUDSEN CO., INC.



PLAN VIEW

NOT TO SCALE

SEE DETAIL I SHEET 5 FOR TYPICAL DECANT DESIGN



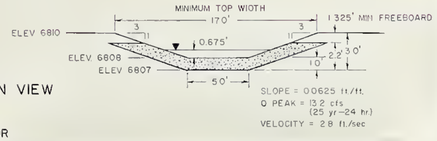
EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL III SHEET 5 FOR TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE

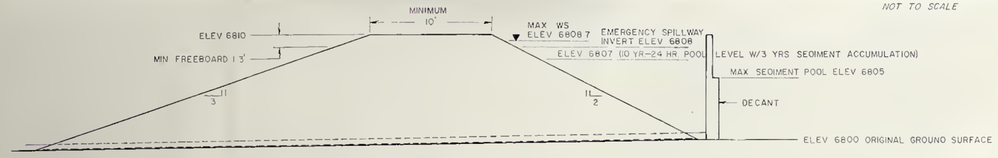
STAGE	VOLUME
	ac /ft
6800	0
6801	0.480
6802	0.960
6803	1.440
6804	1.920
6805	2.400
6806	3.905
6807	5.410
6808	6.915
6809	8.420
6810	9.925
6811	12.465
6812	15.005
6813	17.545
6814	20.085
6815	22.625

STAGE	DISCHARGE
	cfs
0.0	0.0
0.1	0.48
0.2	1.6
0.3	3.1
0.4	5.2
0.5	7.7
0.6	10.7
0.7	14.2
0.8	18.2
0.9	22.7
1.0	27.7



EMERGENCY SPILLWAY CROSS-SECTION

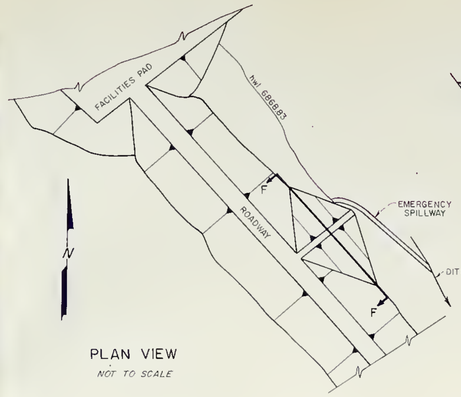
NOT TO SCALE



CROSS-SECTION E-E

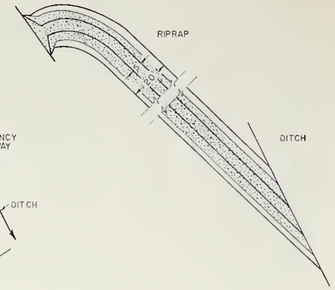
NOT TO SCALE

CONSTRUCTION DETAILS - POND 5



PLAN VIEW

NOT TO SCALE



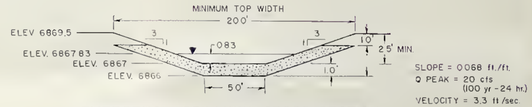
EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL III SHEET 5 FOR TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE

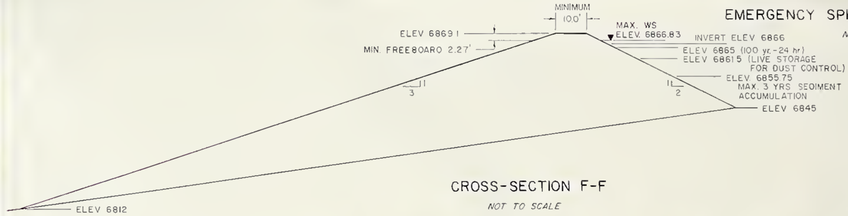
STAGE	VOLUME
	ac /ft
6845	0.0
6846	0.174
6847	0.349
6848	0.523
6849	0.698
6850	0.872
6851	1.331
6852	1.790
6853	2.249
6854	2.708
6855	3.167
6856	3.911
6857	4.654
6858	5.398
6859	6.141
6860	6.885
6861	7.932
6862	8.978
6863	10.025
6864	11.071
6865	12.118

STAGE	DISCHARGE
	cfs
0	0
0.1	0.5
0.2	1.6
0.3	3.3
0.4	5.4
0.5	8.0
0.6	11.1
0.7	14.8
0.8	19.0
0.9	23.7
1.0	28.9



EMERGENCY SPILLWAY CROSS-SECTION

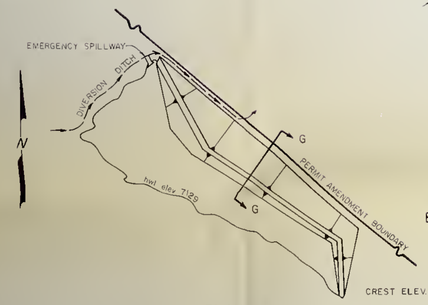
NOT TO SCALE



CROSS-SECTION F-F

NOT TO SCALE

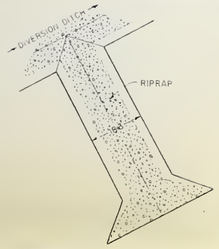
CONSTRUCTION DETAILS - POND 6



PLAN VIEW

NOT TO SCALE

SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

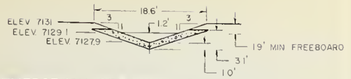


EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

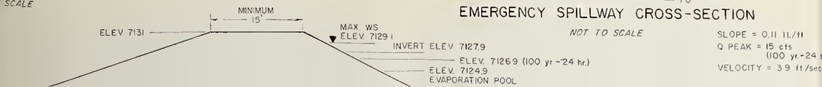
STAGE	VOLUME
	ac /ft
7098	0
7100	0.0275
7105	0.303
7110	1.083
7115	3.448
7120	9.991
7121	12.8146
7122	15.6382
7123	18.4618
7124	21.2854
7125	24.109
7126	26.933

STAGE	DISCHARGE
	cfs
0.0	0.0
0.1	0.02
0.2	0.14
0.3	0.43
0.4	0.91
0.5	1.66
0.6	2.70
0.7	4.1
0.8	5.8
0.9	8.0
1.0	10.6
1.1	13.6
1.2	17.2
1.3	21.3
1.4	25.9
1.5	31.2



EMERGENCY SPILLWAY CROSS-SECTION

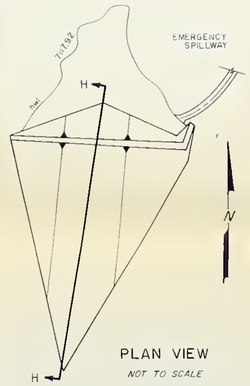
NOT TO SCALE



SLOPE = 0.11 ft./ft.
Q PEAK = 15 cfs
(100 yr.-24 hr.)
VELOCITY = 3.9 ft./sec

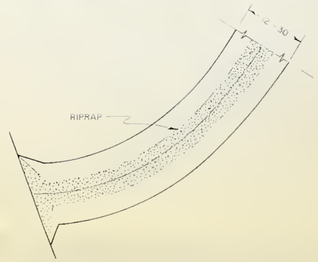
CROSS-SECTION G-G

NOT TO SCALE



PLAN VIEW

NOT TO SCALE



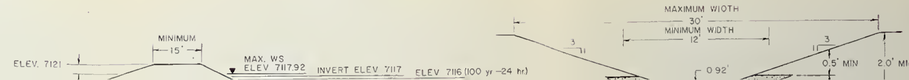
EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

STAGE	VOLUME
	ac /ft
7080	0
7085	0.075
7090	0.300
7095	0.725
7100	1.525
7105	2.775
7106	3.120
7107	3.465
7108	3.810
7109	4.155
7110	4.500
7112	5.420
7113	5.880
7114	6.340
7115	6.800
7116	7.400
7117	7.990
7118	8.585
7119	9.180
7120	9.775
7121	10.590

STAGE	DISCHARGE
	cfs
0	0
0.1	0.02
0.2	0.2
0.3	0.4
0.4	1.0
0.5	1.7
0.6	2.8
0.7	4.3
0.8	6.1
0.9	8.3
1.0	11.0
1.1	14.2
1.2	18.0
1.3	22.2
1.4	27.1
1.5	32.6



PLAN VIEW

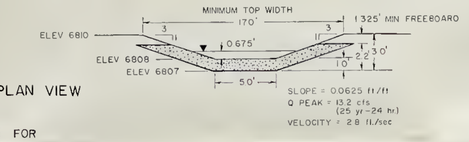
NOT TO SCALE

SEE DETAIL I SHEET 5 FOR TYPICAL DECANT DESIGN

EMERGENCY SPILLWAY PLAN VIEW

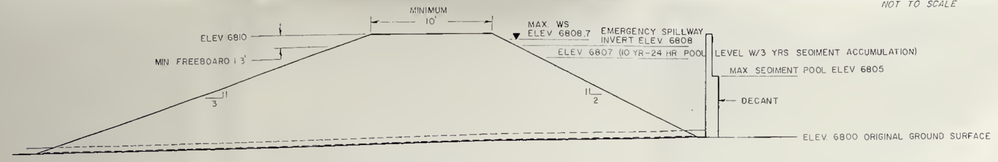
NOT TO SCALE

SEE DETAIL III SHEET 5 FOR TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE



EMERGENCY SPILLWAY CROSS-SECTION

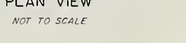
NOT TO SCALE



CROSS-SECTION E-E

NOT TO SCALE

CONSTRUCTION DETAILS - POND 5



PLAN VIEW

NOT TO SCALE

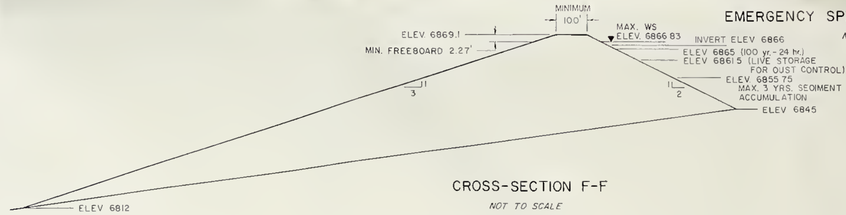
EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL III SHEET 5 FOR TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE

EMERGENCY SPILLWAY CROSS-SECTION

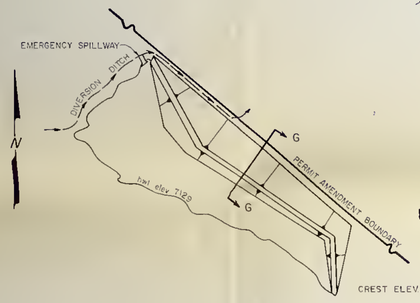
NOT TO SCALE



CROSS-SECTION F-F

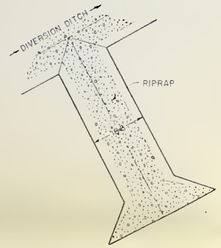
NOT TO SCALE

CONSTRUCTION DETAILS - POND 6



PLAN VIEW

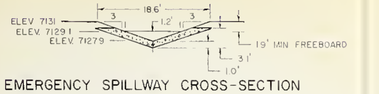
NOT TO SCALE



EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

STAGE	VOLUME	STAGE	DISCHARGE
	ac./ft		cfs
7098	0	0.0	0.0
7100	0.0275	0.1	0.02
7105	0.303	0.2	0.14
7110	1.083	0.3	0.43
7115	3.448	0.4	0.91
7120	9.991	0.5	1.66
7121	12.8146	0.6	2.70
7122	15.6382	0.7	4.1
7123	18.4618	0.8	5.8
7124	21.2854	0.9	8.0
7125	24.109	1.0	10.6
7126	26.933	1.1	13.6
		1.2	17.2
		1.3	21.3
		1.4	25.9
		1.5	31.2

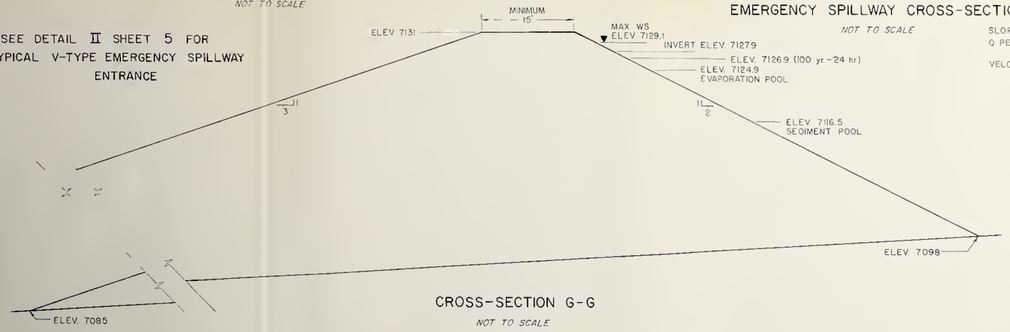


EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

SLOPE = 0.11 ft/ft
Q PEAK = 15 cfs (100 yr.-24 hr.)
VELOCITY = 3.9 ft/sec

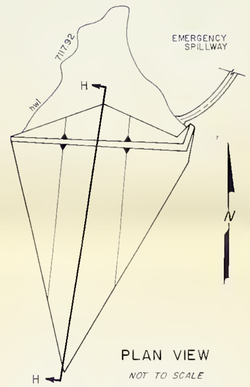
SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE



CROSS-SECTION G-G

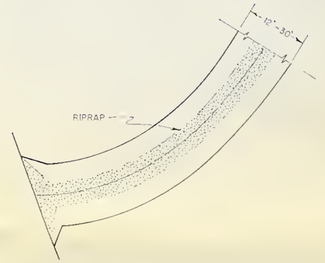
NOT TO SCALE

CONSTRUCTION DETAILS - POND 7



PLAN VIEW

NOT TO SCALE

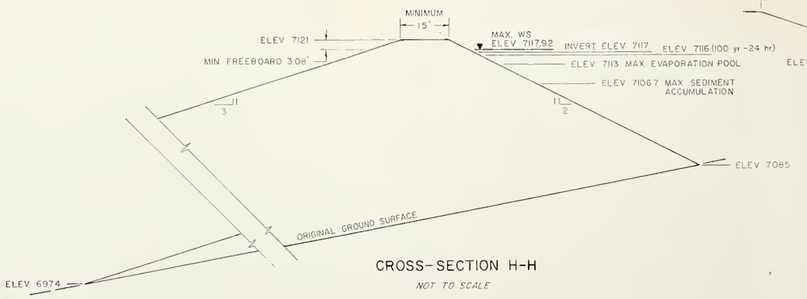


EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

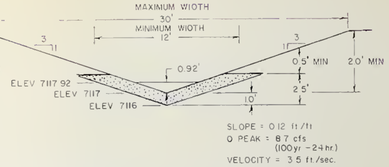
SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

STAGE	VOLUME	STAGE	DISCHARGE
	ac./ft		cfs
7080	0	0	0
7085	0.075	0.1	0.02
7090	0.300	0.2	0.2
7095	0.725	0.3	0.4
7100	1.525	0.4	1.0
7105	2.775	0.5	1.7
7106	3.120	0.6	2.8
7107	3.465	0.7	4.3
7108	3.810	0.8	6.1
7109	4.155	0.9	8.3
7110	4.500	1.0	11.0
	[illegible]	1.1	14.2
7112	5.420	1.2	18.0
7113	5.880	1.3	22.2
7114	6.340	1.4	27.1
7115	6.800	1.5	32.6
7116	7.400		
7117	7.990		
7118	8.585		
7119	9.180		
7120	9.775		
7121	10.590		



CROSS-SECTION H-H

NOT TO SCALE



EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

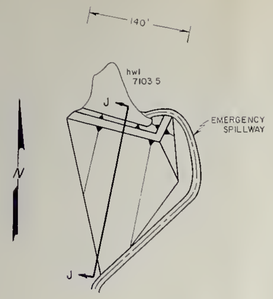
CONSTRUCTION DETAILS - POND 8

RIO BLANCO OIL SHALE CO.
DENVER, COLORADO

CONSTRUCTION DETAILS
PONDS 5, 6, 7 & 8
SHEET 2 OF 5

DRAWN BY ND	DATE	SCALE AS SHOWN		EXHIBIT NO.
APP'D BY		DATE DECEMBER, 1980		G-4
DESIGN BY J.P.O'H.	DATE	DWG. No.		
APP'D BY				

MORRISON - KNUDSEN CO., INC.



PLAN VIEW

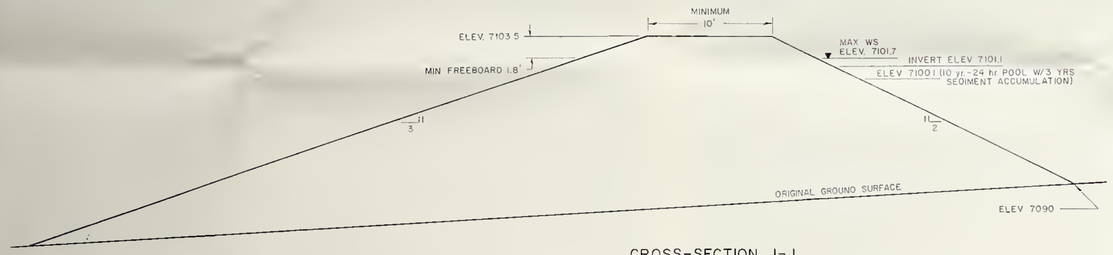
NOT TO SCALE

STAGE	VOLUME	STAGE	DISCHARGE
	ac / ft		cfs
7090	0	0	0
7095	0.07	0.1	0.04
7100	0.35	0.2	0.3
7101	0.47	0.3	0.8
7102	0.60	0.4	1.7
7103	0.72	0.5	3.0
		0.6	4.9
		0.7	7.4
		0.8	10.6
		0.9	14.4
		1.0	19.4

EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

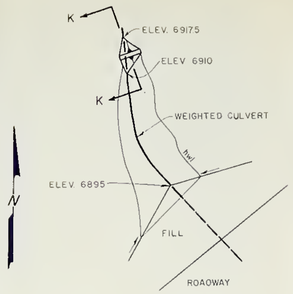
SEE DETAIL II SHEET 5 FOR
TYPICAL V-TYPE EMERGENCY SPILLWAY
ENTRANCE



CROSS-SECTION J-J

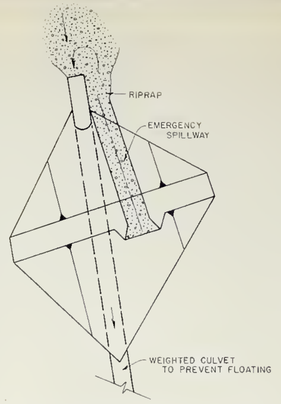
NOT TO SCALE

CONSTRUCTION DETAILS - POND 9



PLAN VIEW

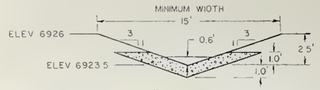
NOT TO SCALE



EMERGENCY SPILLWAY & CULVERT
DETAILS

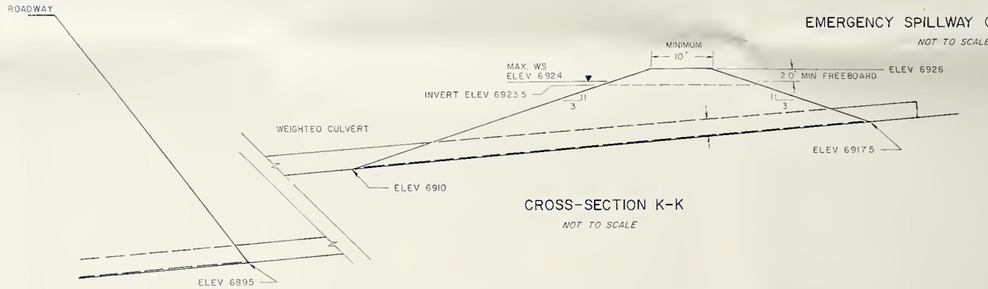
NOT TO SCALE

STAGE	VOLUME	STAGE	DISCHARGE
	ac / ft		cfs
6895	0	0	0
6900	0.09	0.1	0.04
6905	0.19	0.2	0.25
6910	0.28	0.3	0.74
6911	0.37	0.4	1.6
6912	0.47	0.5	2.9
6913	0.58	0.6	4.7
6914	0.72		
6915	0.86		
6916	1.03		
6917	1.21		
6918	1.41		
6919	1.63		
6920	1.87		
6921	2.13		
6922	2.41		
6923	2.72		
6924	3.05		
6925	3.39		
6926	3.77		



EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

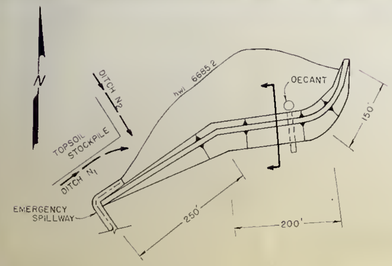


CROSS-SECTION K-K

NOT TO SCALE

SLOPE = 0.33 ft./ft
Q PEAK = 4.7 cfs
(10 yr.-24 hr.)
VELOCITY = 4.4 ft./sec.

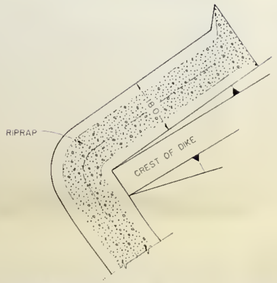
CONSTRUCTION DETAILS - POND 10



PLAN VIEW

NOT TO SCALE

SEE DETAIL I SHEET 5 FOR
TYPICAL DECANT DESIGN

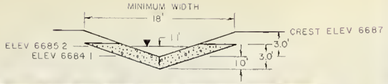


EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL II SHEET 5 FOR
TYPICAL V-TYPE EMERGENCY SPILLWAY
ENTRANCE

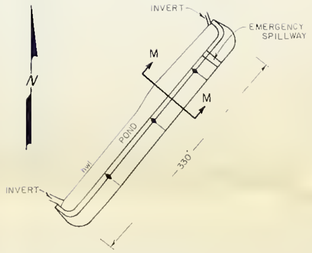
STAGE	VOLUME	STAGE	DISCHARGE
	ac / ft		cfs
6678	0	0.0	0
6679	0.15	0.1	0.01
6680	0.29	0.2	0.1
6681	0.95	0.3	0.3
6682	1.60	0.4	0.6
6683	2.25	0.5	1.0
6684	2.90	0.6	1.7
6685	3.55	0.7	2.5
6686	5.05	0.8	3.6
6687	6.53	0.9	4.9
		1.0	6.5
		1.1	8.3
		1.2	10.5
		1.3	13.0
		1.4	15.8
		1.5	19.0



EMERGENCY SPILLWAY CROSS-SECTION

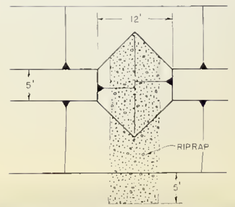
NOT TO SCALE

SLOPE = 0.041 ft./ft
Q PEAK = 8.3 cfs
(25 yr. - 24 hr.)
VELOCITY = 5.2 ft./sec.



PLAN VIEW

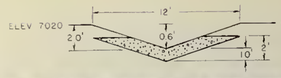
NOT TO SCALE



EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

STAGE	VOLUME	STAGE	DISCHARGE
	ac / ft		cfs
0	0	0	0
1	0.239	0.1	0.04
		0.2	0.25
		0.3	0.73
		0.4	1.6
		0.5	2.9
		0.6	4.7
		0.7	7.1
		0.8	10.1
		0.9	13.8
		1.0	18.3
		1.1	23.6
		1.2	29.8



EMERGENCY SPILLWAY CROSS-SECTION

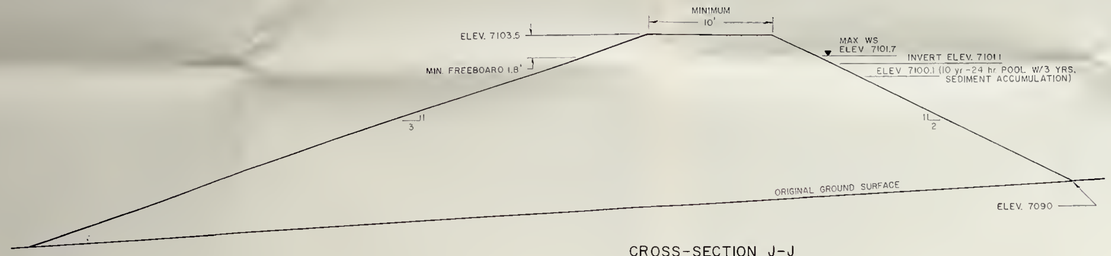
NOT TO SCALE

SLOPE = 0.33 ft./ft
Q PEAK = 4.7 cfs

PLAN VIEW

NOT TO SCALE

TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE



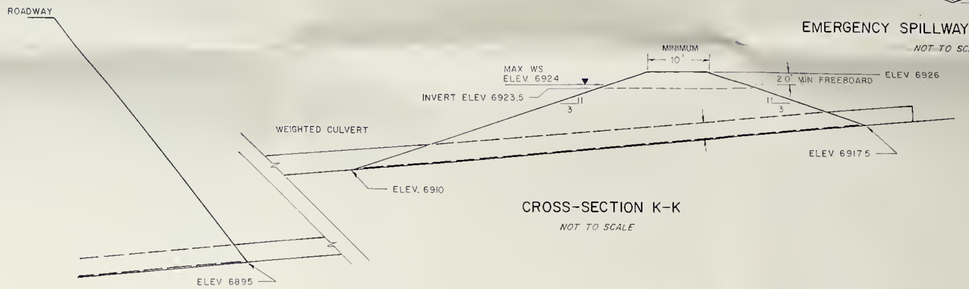
CROSS-SECTION J-J

NOT TO SCALE

CONSTRUCTION DETAILS - POND 9

EMERGENCY SPILLWAY & CULVERT DETAILS

NOT TO SCALE



CROSS-SECTION K-K

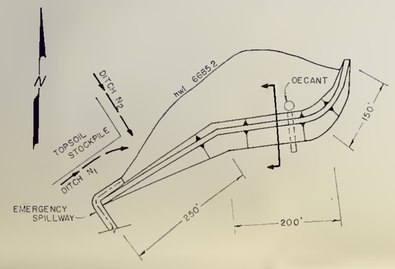
NOT TO SCALE

EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

SLOPE = 0.33 ft/ft
Q PEAK = 4.7 cfs (10 yr.-24 hr.)
VELOCITY = 4.4 ft./sec.

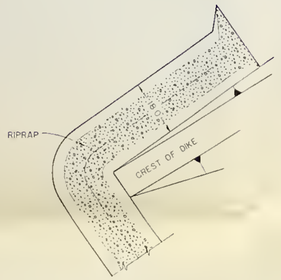
CONSTRUCTION DETAILS - POND 10



PLAN VIEW

NOT TO SCALE

SEE DETAIL I SHEET 5 FOR TYPICAL DECANT DESIGN

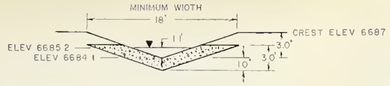


EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL II SHEET 5 FOR TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

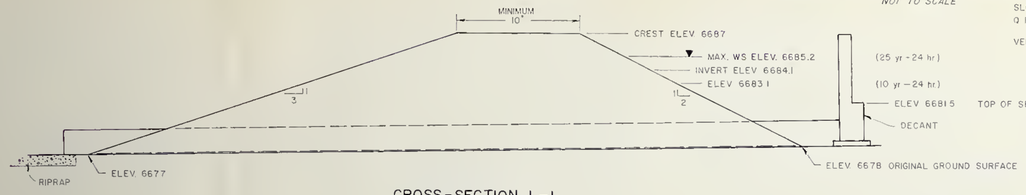
STAGE	VOLUME ac/ft	STAGE	DISCHARGE cfs
6678	0	0.0	0
6679	0.15	0.1	0.01
6680	0.29	0.2	0.1
6681	0.95	0.3	0.3
6682	1.60	0.4	0.6
6683	2.25	0.5	1.0
6684	2.90	0.6	1.7
6685	3.55	0.7	2.5
6686	5.05	0.8	3.6
6687	6.53	0.9	4.9
		1.0	6.5
		1.1	8.3
		1.2	10.5
		1.3	13.0
		1.4	15.8
		1.5	19.0



EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

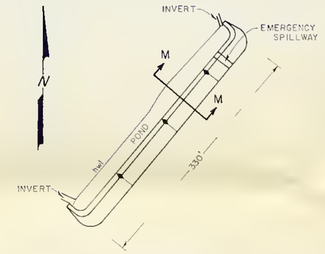
SLOPE = 0.041 ft./ft.
Q PEAK = 8.3 cfs (25 yr.-24 hr.)
VELOCITY = 2.3 ft./sec.



CROSS-SECTION L-L

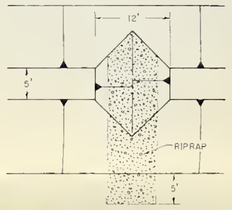
NOT TO SCALE

CONSTRUCTION DETAILS - POND 11



PLAN VIEW

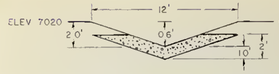
NOT TO SCALE



EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

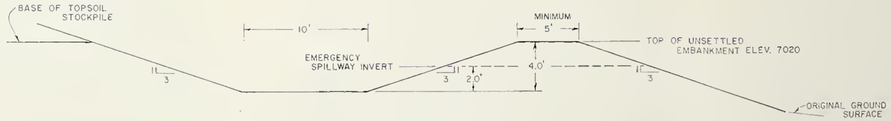
STAGE	VOLUME ac/ft	STAGE	DISCHARGE cfs
0	0	0	0
1	0.239	0.1	0.04
		0.2	0.25
		0.3	0.73
		0.4	1.6
		0.5	2.9
		0.6	4.7
		0.7	7.1
		0.8	10.1
		0.9	13.8
		1.0	18.3
		1.1	23.6
		1.2	29.8



EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

SLOPE = 0.33 ft./ft.
Q PEAK = 4.7 cfs (25 yr.-24 hr.)
VELOCITY = 4.3 ft./sec.



CROSS-SECTION M-M

NOT TO SCALE

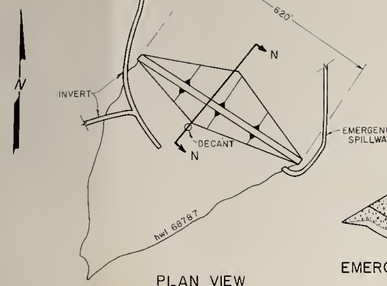
CONSTRUCTION DETAILS - POND 12

RIO BLANCO OIL SHALE CO.
DENVER, COLORADO

CONSTRUCTION DETAILS
PONDS 9, 10, 11 & 12
SHEET 3 OF 5

DRAWN BY NO	DATE	SCALE AS SHOWN	EXHIBIT No.
APP'D BY	DATE	DATE DECEMBER, 1980	G-5
DESIGN BY J.P.O'H	DATE	DWG No.	
APP'D BY			

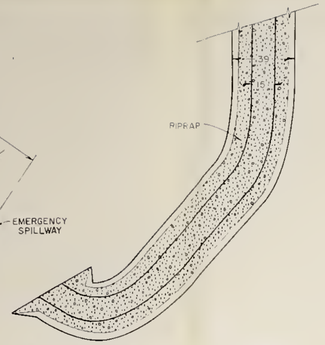
MORRISON - KNUDSEN CO., INC.



PLAN VIEW

NOT TO SCALE

SEE DETAIL I SHEET 5 FOR TYPICAL DECANT DESIGN

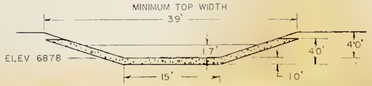


EMERGENCY SPILLWAY PLAN VIEW

NOT TO SCALE

SEE DETAIL III SHEET 5 FOR TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE

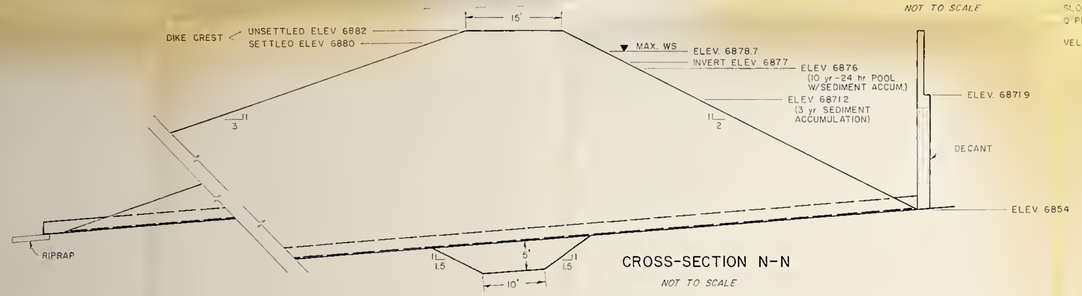
STAGE	VOLUME ac/ft	STAGE	DISCHARGE cfs
6854	0	0	0
6855	0.016	0.1	1.7
6856	0.151	0.2	5.4
6857	0.287	0.3	10.7
6858	0.422	0.4	17.4
6859	0.558	0.5	25.4
6860	0.693	0.6	34.7
6861	1.069	0.7	45.2
6862	1.445	0.8	56.9
6863	1.821	0.9	69.8
6864	2.197	1.0	83.8
6865	2.573	1.1	99.1
6866	3.734	1.2	115.5
6867	4.895	1.3	133.1
6868	6.055	1.4	151.8
6869	7.216	1.5	171.8
6870	8.377	1.6	192.9
6871	10.411	1.7	215.2
6872	12.445	1.8	238.7
6873	14.479	1.9	263.5
6874	16.513	2.0	289.5
6875	18.547		
6876	21.981		
6877	25.416		
6878	28.850		
6879	32.285		
6880	35.719		



EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE

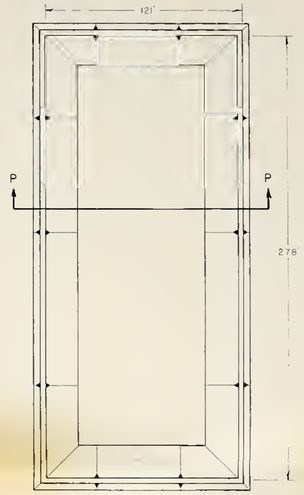
SLOPE = 0.078 ft/ft
Q PEAK = 1960 cfs (100 yr-24 hr)
VELOCITY = 1.62 ft/sec



CROSS-SECTION N-N

NOT TO SCALE

CONSTRUCTION DETAILS - POND 13



PLAN VIEW

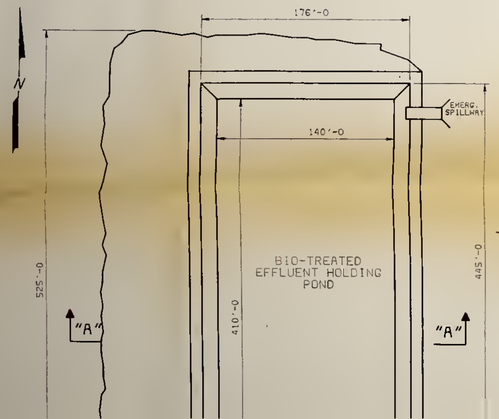
NOT TO SCALE

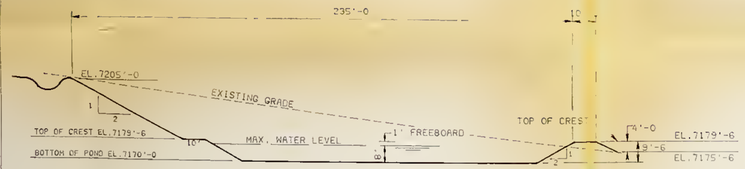
LINED, INCISED POND - EARTH DIKE
DEPTH = 8.0', VOLUME = 261,900 ft³

CROSS-SECTION P-P

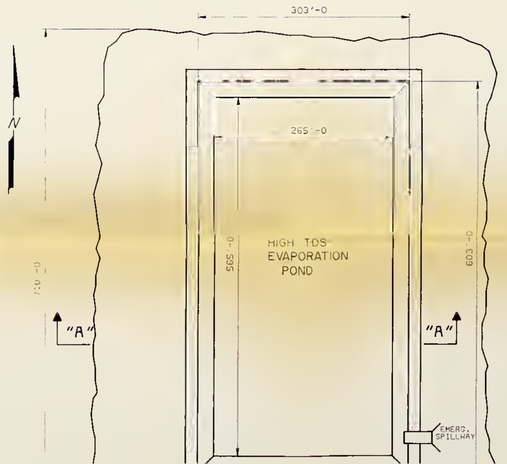
NOT TO SCALE

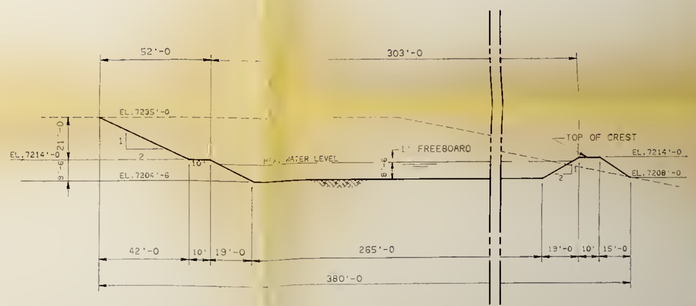
CONSTRUCTION DETAILS - POND 14





SECTION A-A

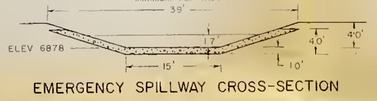




NOT TO SCALE

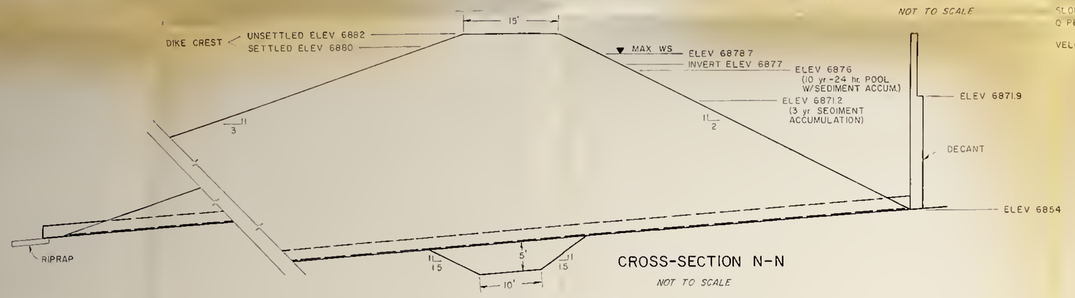
SEE DETAIL I SHEET 5 FOR TYPICAL DECANT DESIGN

SEE DETAIL III SHEET 5 FOR TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE



EMERGENCY SPILLWAY CROSS-SECTION

NOT TO SCALE



CROSS-SECTION N-N

NOT TO SCALE

SLOPE = 0.078 ft/ft
Q PEAK = 1960cfs (100 yr-24 hr)
VELOCITY = 16.2 ft/sec

CONSTRUCTION DETAILS - POND 13

PLAN VIEW

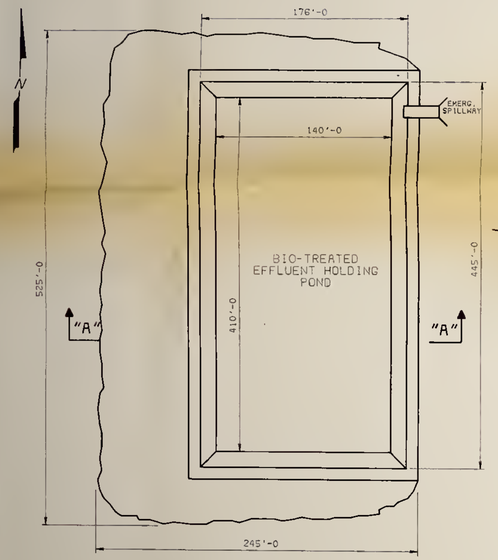
NOT TO SCALE

LINED, INCISED POND - EARTH DIKE
DEPTH = 8.0', VOLUME = 261,900 ft³

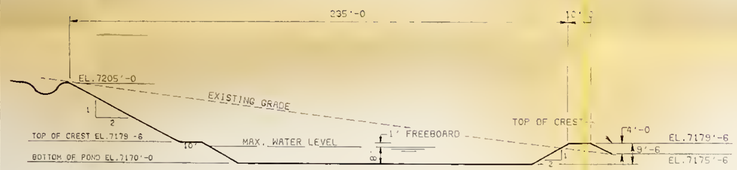
CROSS-SECTION P-P

NOT TO SCALE

CONSTRUCTION DETAILS - POND 14



DISTURBED AREA = 4 ACRES

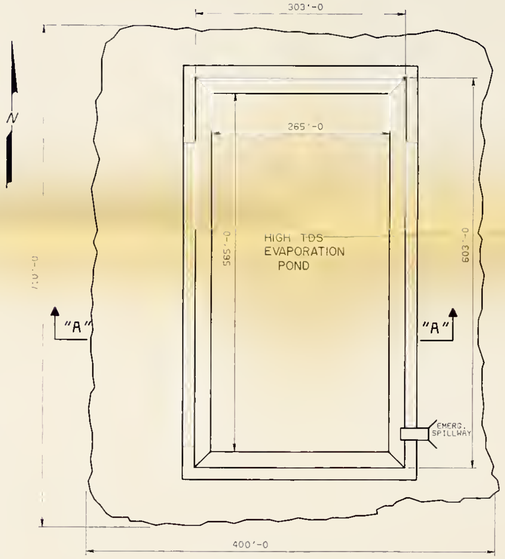


SECTION A-A

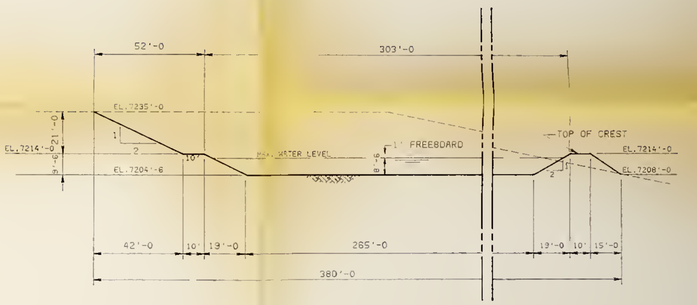
1. LINED POND - EARTH DIKE
2. CREST ELEVATIONS AS SHOWN INCLUDES 5% ALLOWANCE FOR SETTLEMENT.

DEPTH, FT.	1	2	3	4	5	6	7	8
WATER VOL., Cu Ft	57,400	117,000	178,900	243,000	309,500	378,300	449,500	523,100

CONSTRUCTION DETAILS - POND 15



DISTURBED AREA = 8 ACRES



SECTION A-A

1. UNLINED POND - EARTH DIKE
2. CREST ELEVATIONS AS SHOWN INCLUDES 5% ALLOWANCE FOR SETTLEMENT.

DEPTH, FT.	1	2	3	4	5	6	7	8	8.5
WATER VOL., Cu Ft	152,200	307,800	466,800	629,200	795,100	964,400	1,137,300	1,313,700	1,492,800

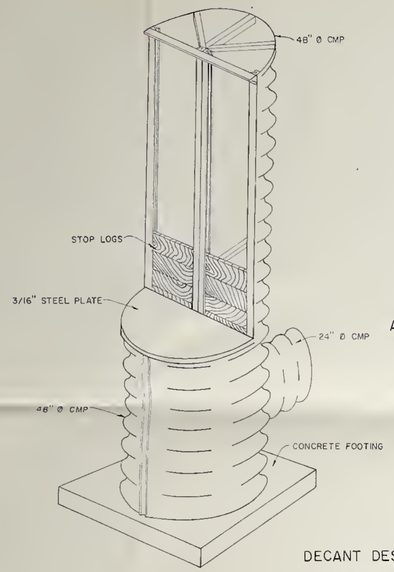
CONSTRUCTION DETAILS - POND 16

RIO BLANCO OIL SHALE CO.
DENVER, COLORADO

CONSTRUCTION DETAILS
PONDS 13, 14, 15 & 16
SHEET 4 OF 5

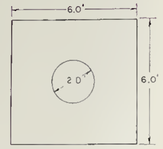
DRAWN BY ND/LUMMUS	DATE	SCALE AS SHOWN	EXHIBIT No. G-6
APP'D BY		DATE DECEMBER, 1980	
DESIGNED BY JO/LUMMUS	DATE	JOB No.	
APP'D BY			

MORRISON-KNUDSEN CO., INC.



DECANT DESIGN

NOT TO SCALE



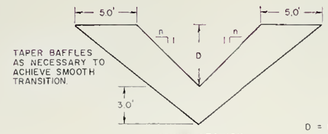
LOW-LEVEL OUTLET RISER

CONCRETE COLLARS ARE 8" THICK ON 45° CENTERS.

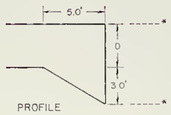
ANTI SEEP COLLAR DESIGN

NOT TO SCALE

DETAIL I



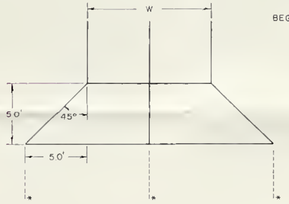
CROSS-SECTION



PROFILE

D = DESIGN DEPTH OF EMERGENCY SPILLWAY OR TOTAL CUT DEPTH (IF APPLICABLE), WHICHEVER IS GREATER.

n = DITCH SIDE SLOPES



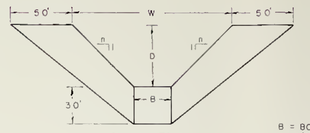
PLAN

* CONTINUED TO DAYLIGHT NATURAL TERRAIN IF NECESSARY.

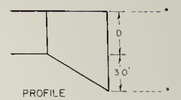
TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

NOT TO SCALE

DETAIL II



CROSS-SECTION

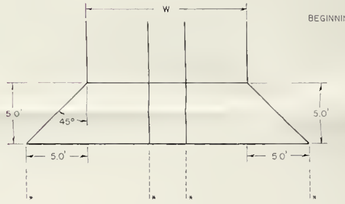


PROFILE

B = BOTTOM WIDTH OF EMERGENCY SPILLWAY

D = DEPTH OF EMERGENCY SPILLWAY NATURAL CUT DEPTH (IF APPLICABLE) WHICHEVER IS GREATER.

n = DITCH SIDE SLOPES



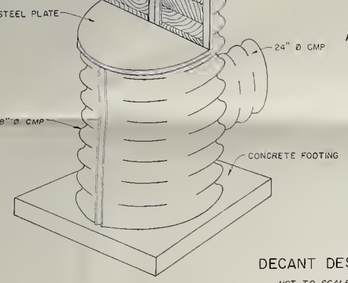
PLAN

* CONTINUED TO DAYLIGHT NATURAL TERRAIN IF NECESSARY.

TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE

NOT TO SCALE

DETAIL III



DECANT DESIGN

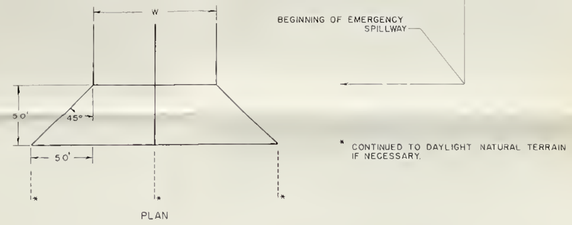
NOT TO SCALE

ARE 8" THICK ON 45° CENTERS

ANTI SEEP COLLAR DESIGN

NOT TO SCALE

DETAIL I

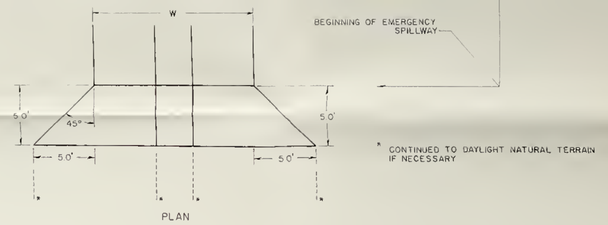


PLAN

TYPICAL V-TYPE EMERGENCY SPILLWAY ENTRANCE

NOT TO SCALE

DETAIL II



PLAN

TYPICAL TRAPAZOIDAL EMERGENCY SPILLWAY ENTRANCE

NOT TO SCALE

DETAIL III

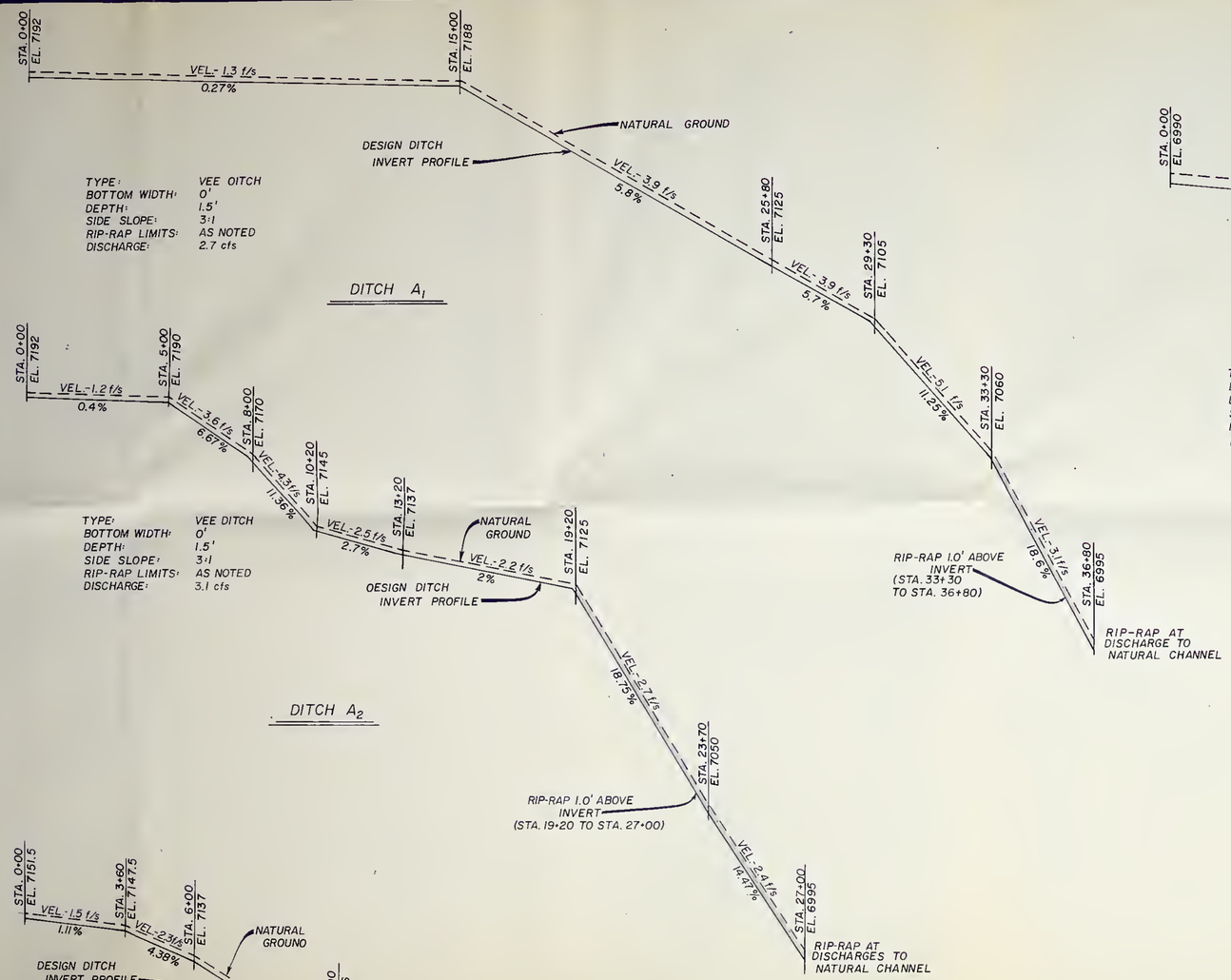
RIO BLANCO OIL SHALE CO.

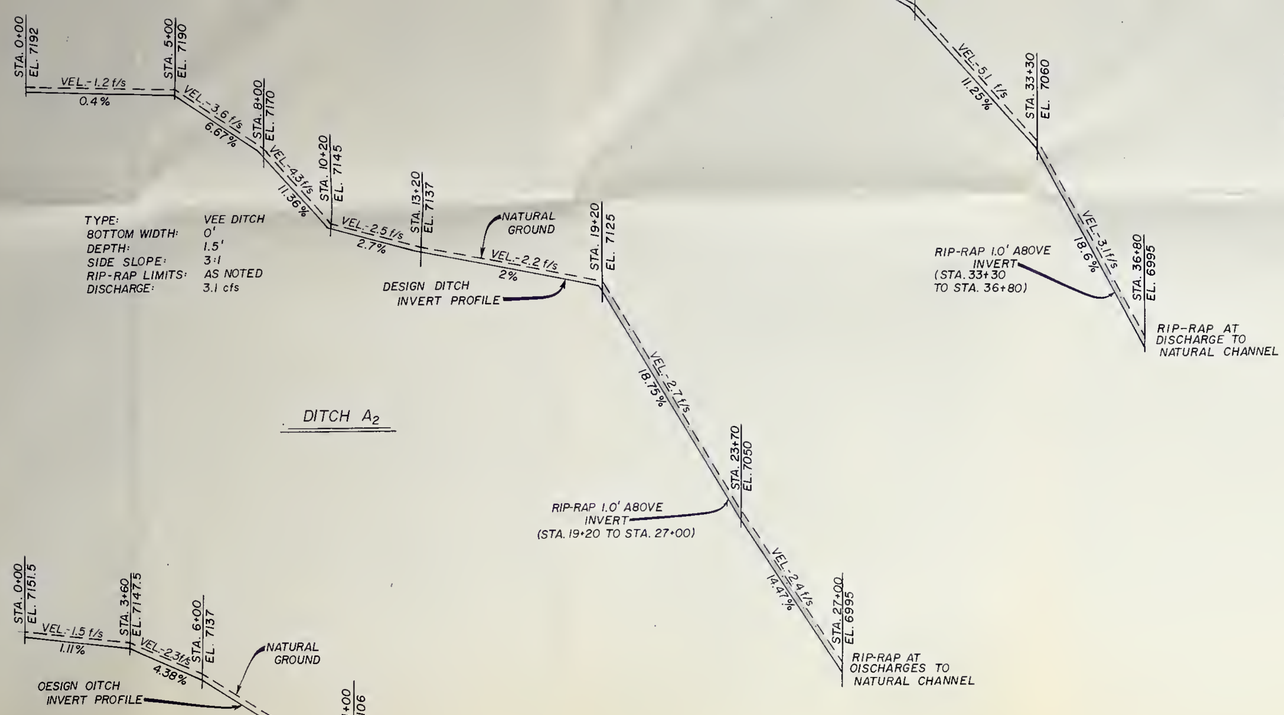
DENVER, COLORADO

TYPICAL DETAILS
WATER CONTROL PONDS
SHEET 5 OF 5

DRAWN BY: ND	DATE	SCALE: AS SHOWN	EXHIBIT No. G-7
APPD BY:		DATE: DECEMBER, 1980	
DESIGN BY: J.P.O'H.	DATE	DWG No.	
APPD BY:			

MORRISON - KNUDSEN CO., INC.


STA. 0+00
EL. 7192
VEL.- 1.3 f/s
0.27%
STA. 15+00
EL. 7188
NATURAL GROUND
DESIGN DITCH
INVERT PROFILE
VEL.- 3.9 f/s
5.8%
STA. 25+80
EL. 7125
VEL.- 3.9 f/s
5.7%
STA. 29+30
EL. 7105
VEL.- 5.1 f/s
11.25%
STA. 33+30
EL. 7060
VEL.- 3.1 f/s
18.6%
STA. 36+80
EL. 6995
RIP-RAP AT
DISCHARGE TO
NATURAL CHANNEL
TYPE: VEE OITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
RIP-RAP LIMITS: AS NOTED
DISCHARGE: 2.7 cfs
DITCH A1
STA. 0+00
EL. 7192
VEL.- 1.2 f/s
0.4%
STA. 5+00
EL. 7190
VEL.- 3.6 f/s
6.67%
STA. 8+00
EL. 7170
VEL.- 4.3 f/s
11.36%
STA. 10+20
EL. 7145
VEL.- 2.5 f/s
2.7%
STA. 13+20
EL. 7137
NATURAL
GROUND
VEL.- 2.2 f/s
2%
STA. 19+20
EL. 7125
OESIGN DITCH
INVERT PROFILE
VEL.- 2.7 f/s
18.75%
STA. 23+70
EL. 7050
VEL.- 2.4 f/s
14.27%
STA. 27+00
EL. 6995
RIP-RAP AT
DISCHARGES TO
NATURAL CHANNEL
RIP-RAP 1.0' ABOVE
INVERT
(STA. 33+30
TO STA. 36+80)
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
RIP-RAP LIMITS: AS NOTED
DISCHARGE: 3.1 cfs
RIP-RAP 1.0' ABOVE
INVERT
(STA. 19+20 TO STA. 27+00)
DITCH A2
STA. 0+00
EL. 7151.5
VEL.- 1.5 f/s
1.11%
STA. 3+60
EL. 7147.5
VEL.- 2.3 f/s
4.38%
STA. 6+00
EL. 7137
NATURAL
GROUND
DESIGN DITCH
INVERT PROFILE
6%
STA. 11+00
EL. 7106
JOINS DITCH A4 AT
STA. 5+00
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 0.9 cfs
STA. 0+00
EL. 7105
NATURAL
GROUND
VEE DITCH
OEPTH 2.5'
8.1%
OESIGN DITCH
INVERT PROFILE
STA. 6+80
EL. 7050
2' DIA. CMP
INLET DEPTH 2.5'
OUTLET DEPTH 2.0'
(STA 6+80 TO STA. 8+40)
STA. 8+40
EL. 6995
DITCH A3
STA. 0+00
EL. 7150
VEL.- 4.2 f/s
8.4%
STA. 2+00
EL. 7130
STA. 0+00
EL. 6990
VEL.- 3.4 f/s
0.83%
STA. 6+00
EL. 6985
VEL.- 4.0 f/s
1.25%
STA. 10+00
EL. 6980
VEL.- 4.0 f/s
1.7%
NATURAL
GROUND
STA. 21+40
EL. 6960
VEL.- 4.9 f/s
2.8%
STA. 32+40
EL. 6929
VEL.- 21 f/s
26.3%
STA. 35+40
EL. 6850
RIP-RAP AT DISCHARGES TO
DRY FORK
TYPE: AS NOTED
BOTTOM WIDTH: 0' (VEE DITCH)
DEPTH: AS NOTED
SIOE SLOPE: 3:1 (VEE DITCH)
RIP-RAP LIMITS: AT OUTLET
DISCHARGE: 29.1 cfs (STA.0+00 TO STA. 10+00)
21.0 cfs (STA.10+00 TO STA. 35+40)
2' DIA. CMP
INLET DEPTH 3'
OUTLET DEPTH 0'
(STA. 32+40 TO STA. 35+40)
DITCH A7
STA. 0+00
EL. 7033
VEL.- 2.6 f/s
11.2%
STA. 3+40
EL. 6995
NATURAL
GROUND
VEL.- 2.5 f/s
1.72%
STA. 9+20
EL. 6985
VEL.- 3.0 f/s
6.25%
STA. 13+20
EL. 6960
VEL.- 2.9 f/s
5.26%
STA. 17+00
EL. 6940
VEL.- 2.8 f/s
5%
STA. 19+60
EL. 6920
DISCHARGES TO
POND 2
RIP-RAP 1.0' ABOVE
INVERT
(STA. 0+00 TO
STA. 3+40)
VEE DITCH
OEPTH 2.0'
TRAPAZOIDAL DITCH
OEPTH 2.0'
(STA. 3+40 TO
STA. 19+60)
DESIGN OITCH
INVERT PROFILE
RIP-RAP 1.0' ABOVE
INVERT
(STA. 9+20 TO STA. 19+60)
TYPE: AS NOTED
BOTTOM WIOTH: 0'(VEE DITCH)
6'(TRAP. DITCH-STA. 3+40 TO 9+20)
3'(TRAP. DITCH-STA. 9+20 TO 19+60)
OEPTH: AS NOTED
SIDE SLOPE: 2.5:1 (VEE & TRAP. DITCHES)
RIP-RAP LIMITS: AS NOTED
DISCHARGE: 12.6 cfs
DITCH B1
STA. 0+00
EL. 6921
VEL.- 2.1 f/s
9.5%
STA. 2+00
EL. 6910
NATURAL
GROUND
4%
STA. 6+00
EL. 6894
RIP-RAP 0.5' ABOVE
INVERT
(STA. 0+00 TO STA. 2+00)
DESIGN OITCH
INVERT PROFILE
DISCHARGE AT
POND 3
TYPE: TRAPAZOIDAL DITCH
BOTTOM WIDTH: 0'
OEPTH 0.5' (STA. 0+00 TO STA. 1+40)
1.5' (STA. 1+40 TO STA. 4+60)
SIDE SLOPE: 2.5:1
VELOCITY: 1.8 f/s (STA. 0+00 TO 1+40)
2.1 f/s (STA. 1+40 TO 4+60)
DISCHARGE: 1.9 cfs
STA. 0+00
EL. 6940
NATURAL GROUND
DESIGN DITCH
INVERT PROFILE
STA. 1+20
EL. 6909
DISCHARGES TO
POND 4
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.0'
SIDE SLOPE: 2.5:1
RIP-RAP LIMITS: 1.0' ABOVE INVERT
VELOCITY: 2.5 f/s
DISCHARGE: 3.2 cfs

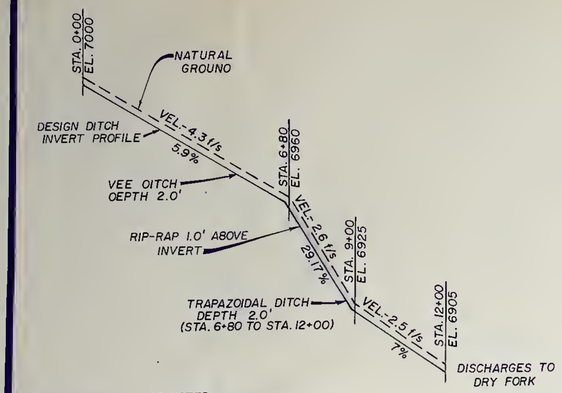


RIO BLANCO OIL SHALE COMPANY
RIO BLANCO COUNTY, COLORADO

DITCH PROFILE

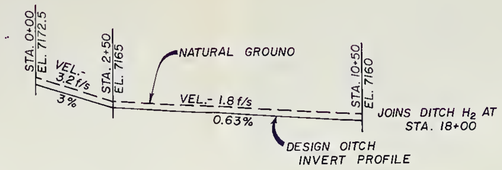
DRAWN BY: NDP	DATE	SCALE: 1"=20'V. ; 1"=200'H.	EXHIBIT NO. G-8
APP'D BY:		DATE: 12/80	
DESIGN BY: J.P.Q.	DATE	DWG. NO: SHT. 1 OF 5	
APP'D BY:			

MORRISON-KNUDSEN COMPANY, INC.
MINING GROUP / BOISE, IDAHO



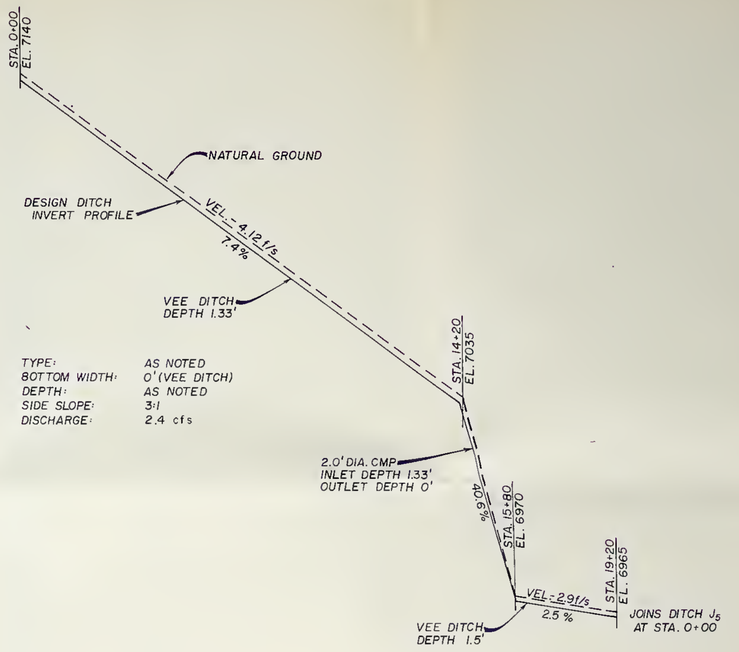
TYPE:	AS NOTED
BOTTOM WIDTH:	0' (VEE DITCH) 10' (TRAP. DITCH - STA. 6+80 TO 9+00) 15' (TRAP. DITCH - STA. 9+00 TO 12+00)
OEPTH:	AS NOTED
SIDE SLOPES:	3:1
RIP-RAP LIMITS:	AS NOTED
OISCHARGE:	40 cfs

DITCH D



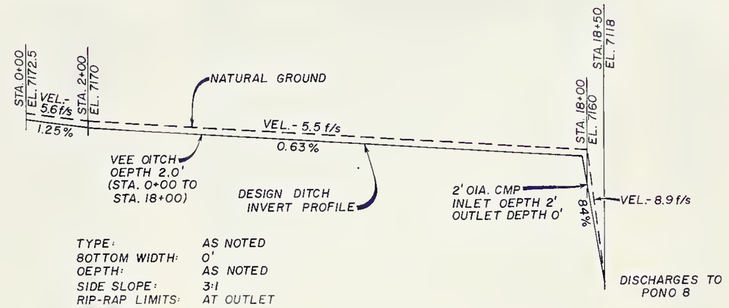
TYPE:	VEE DITCH
BOTTOM WIDTH:	0'
OEPTH:	2.0'
SIOE SLOPE:	3:1
OISCHARGE:	3.5 cfs

DITCH H_1



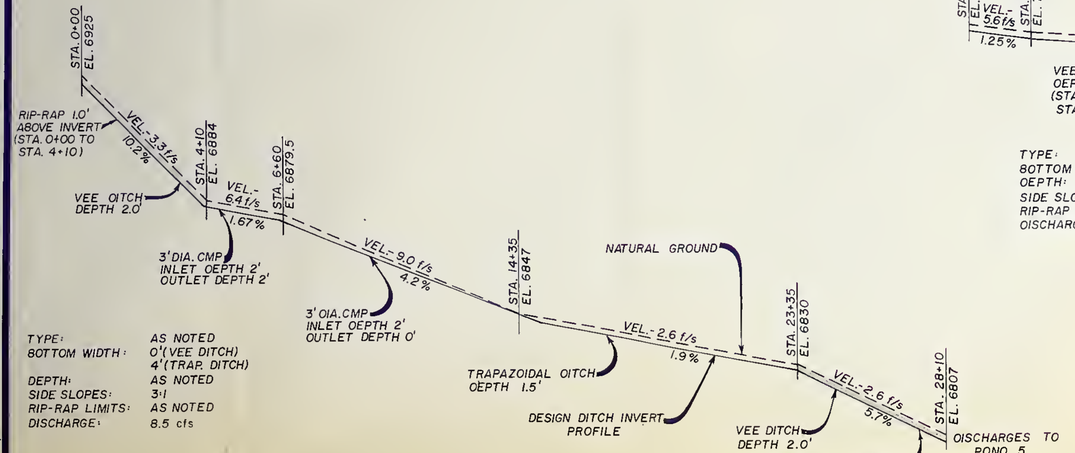
TYPE:	AS NOTED
BOTTOM WIDTH:	0' (VEE DITCH)
DEPTH:	AS NOTED
SIDE SLOPE:	3:1
DISCHARGE:	2.4 cfs

DITCH J_4



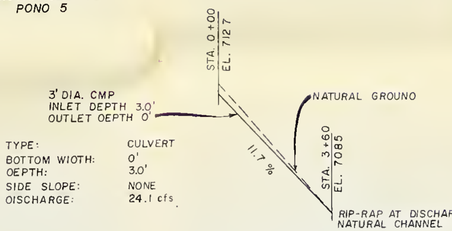
TYPE:	AS NOTED
BOTTOM WIDTH:	0'
OEPTH:	AS NOTED
SIDE SLOPE:	3:1
RIP-RAP LIMITS:	AT OUTLET
OISCHARGE:	5.4 cfs

DITCH H_2



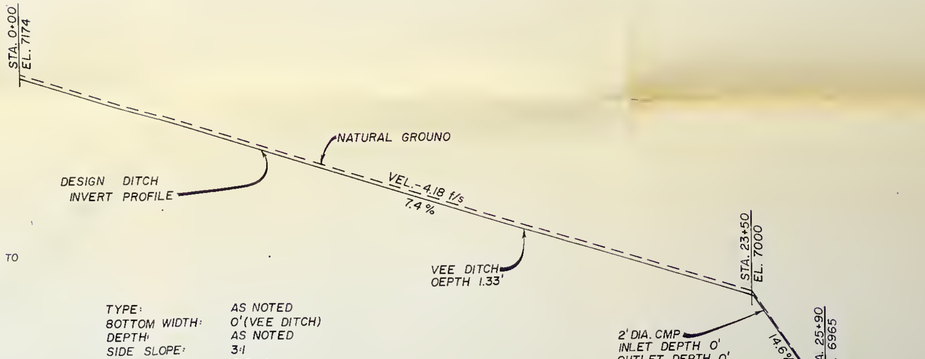
TYPE:	AS NOTED
BOTTOM WIDTH:	0' (VEE DITCH) 4' (TRAP. DITCH)
DEPTH:	AS NOTED
SIDE SLOPES:	3:1
RIP-RAP LIMITS:	AS NOTED
DISCHARGE:	8.5 cfs

DITCH E

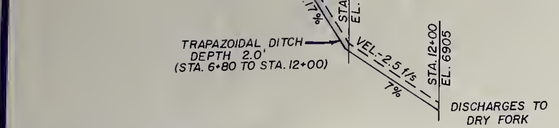


TYPE:	CULVERT
BOTTOM WIOTH:	0'
OEPTH:	3.0'
SIDE SLOPE:	NONE
OISCHARGE:	24.1 cfs

CULVERT G4

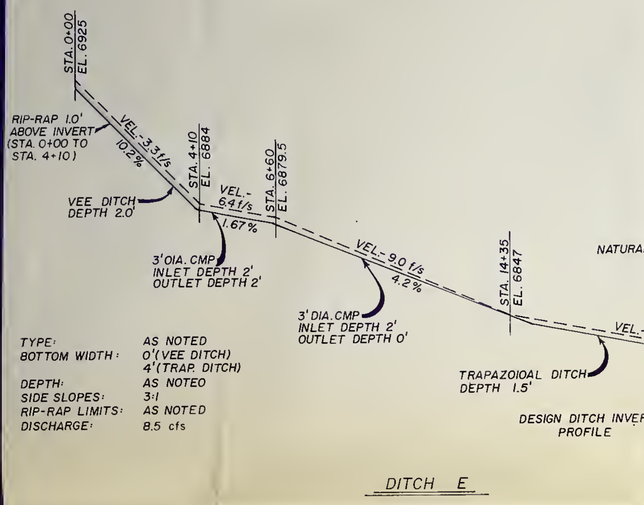


TYPE:	AS NOTED
BOTTOM WIDTH:	0' (VEE DITCH)
DEPTH:	AS NOTED
SIDE SLOPE:	3:1
OISCHARGE:	2.6 cfs



TYPE: AS NOTED
BOTTOM WIDTH: 0'(VEE DITCH)
10'(TRAP. DITCH-STA. 6+80 TO 9+00)
15'(TRAP. DITCH-STA. 9+00 TO 12+00)
DEPTH: AS NOTED
SIDE SLOPES: 3:1
RIP-RAP LIMITS: AS NOTED
DISCHARGE: 4.0 cfs

DITCH D



TYPE: AS NOTED
BOTTOM WIDTH: 0'(VEE DITCH)
4'(TRAP. DITCH)
DEPTH: AS NOTED
SIDE SLOPES: 3:1
RIP-RAP LIMITS: AS NOTED
DISCHARGE: 8.5 cfs

DITCH E

TYPE: AS NOTED
BOTTOM WIDTH: 0'
DEPTH: AS NOTED
SIOE SLOPE: 3:1
RIP-RAP LIMITS: AT OUTLET
DISCHARGE: 5.4 cfs

DITCH H2

TYPE: VEE OITCH
BDTTDM WIDTH: 0'
DEPTH: 2.5'
SIDE SLDPE: 3:1
DISCHARGE: 9.1 cfs

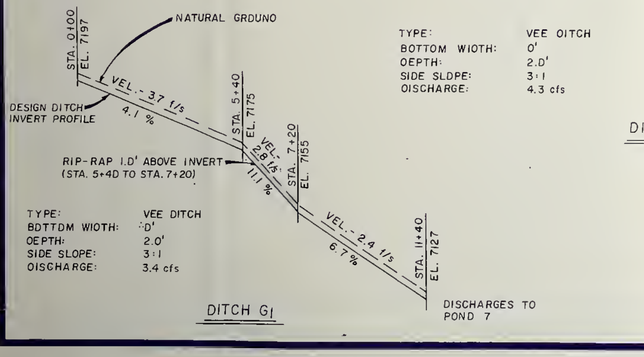
DITCH G3

TYPE: CULVERT
BDTTDM WIDTH: D'
DEPTH: 3.0'
SIDE SLOPE: NONE
DISCHARGE: 24.1 cfs

CULVERT G4

TYPE: VEE OITCH
BDTTDM WIOTH: 0'
DEPTH: 2.0'
SIDE SLDPE: 3:1
DISCHARGE: 4.3 cfs

DITCH G2



TYPE: VEE DITCH
BDTTDM WIOTH: :D'
DEPTH: 2.0'
SIDE SLOPE: 3:1
DISCHARGE: 3.4 cfs

DITCH G1

TYPE: AS NOTED
BOTTOM WIDTH: 0'(VEE DITCH)
DEPTH: AS NOTED
SIDE SLOPE: 3:1
DISCHARGE: 2.6 cfs

DITCH J3

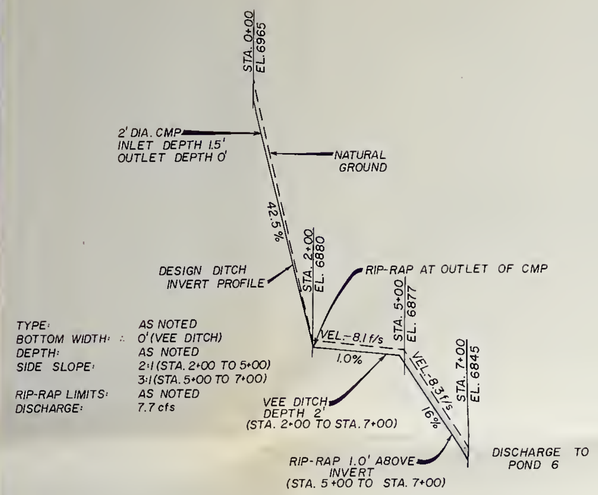
DITCH J4

RIO BLANCO OIL SHALE COMPANY
RIO BLANCO COUNTY, COLORADO

DITCH PROFILE

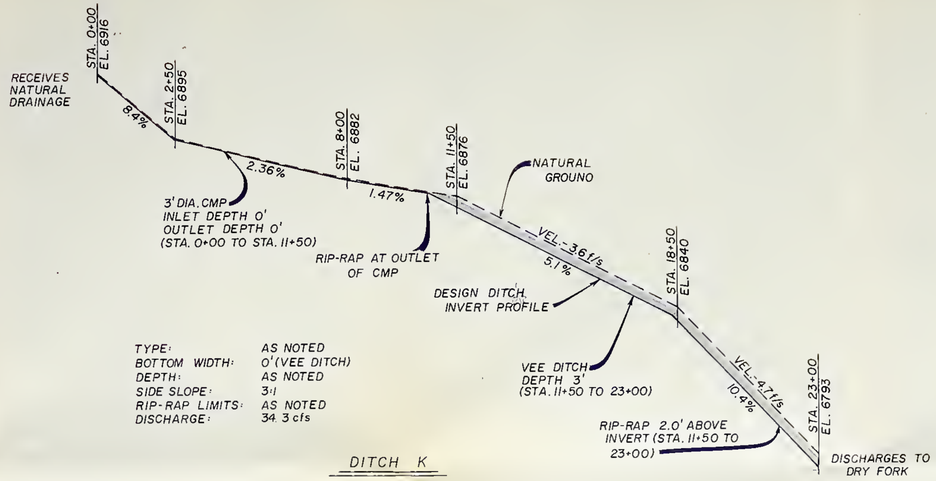
DRAWN BY: NOP	DATE	SCALE: 1"=20'V.; 1"=200'H.	EXHIBIT NO. G-9
APP'D BY:		DATE: 12/80	
DESIGN BY: J.P.O.	DATE	DWG. NO.- SHT. 2 OF 5	
APP'D. BY:			

MORRISON-KNUDSEN COMPANY, INC.
MINING GROUP / BOISE, IDAHO



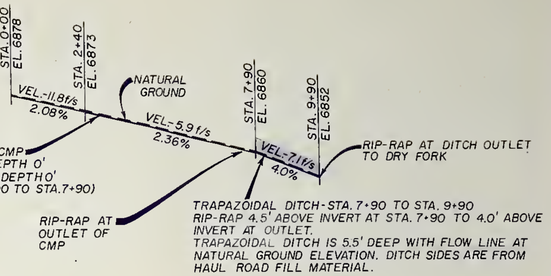
TYPE:	AS NOTED
BOTTOM WIDTH:	0'(VEE DITCH)
DEPTH:	AS NOTED
SIDE SLOPE:	2:1 (STA. 2+00 TO 5+00) 3:1 (STA. 5+00 TO 7+00)
RIP-RAP LIMITS:	AS NOTED
DISCHARGE:	7.7 cfs

DITCH J5



TYPE:	AS NOTED
BOTTOM WIDTH:	0'(VEE DITCH)
DEPTH:	AS NOTED
SIDE SLOPE:	3:1
RIP-RAP LIMITS:	AS NOTED
DISCHARGE:	34.3 cfs

DITCH K



TYPE:	AS NOTED
BOTTOM WIDTH:	20' (TRAP. DITCH)
DEPTH:	AS NOTED
SIDE SLOPE:	2:1
RIP-RAP LIMITS:	AS NOTED
DISCHARGE:	750.0 cfs

DRY BRANCH DIVERSION
UNDER & ALONG HAUL
ROAD

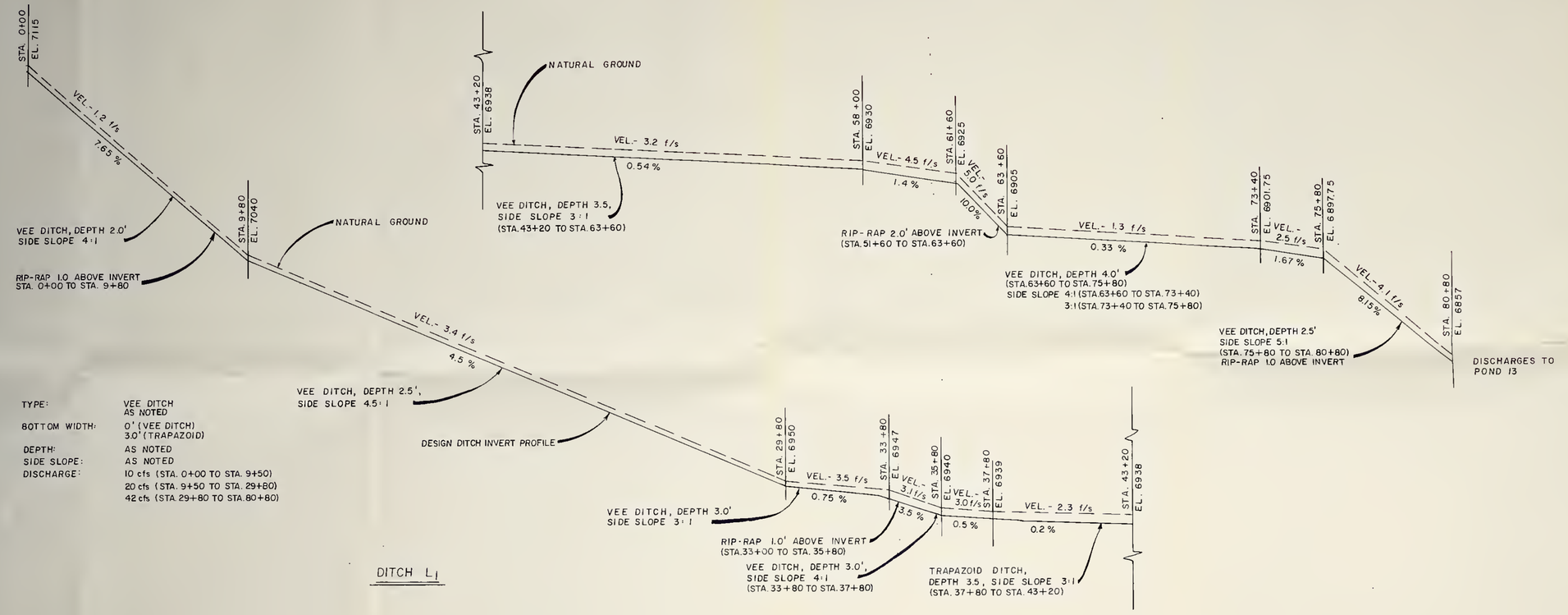
RIO BLANCO OIL SHALE COMPANY

RIO BLANCO COUNTY, COLORADO

DITCH PROFILE

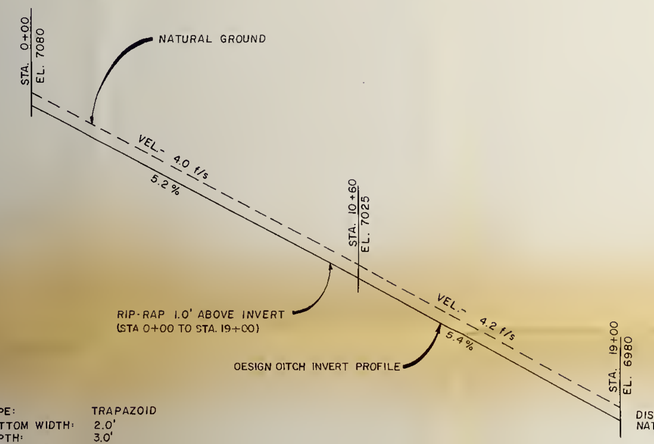
DRAWN BY: NDP	DATE	SCALE: 1"=20' V.; 1"=200' H.	EXHIBIT NO. G-10
APP'D BY:		DATE: 12/80	
DESIGN BY:	DATE	DWG. NO.: SHT. 3 OF 5	
APP'D. BY:			

MORRISON-KNUDSEN COMPANY, INC.
MINING GROUP / BOISE, IDAHO

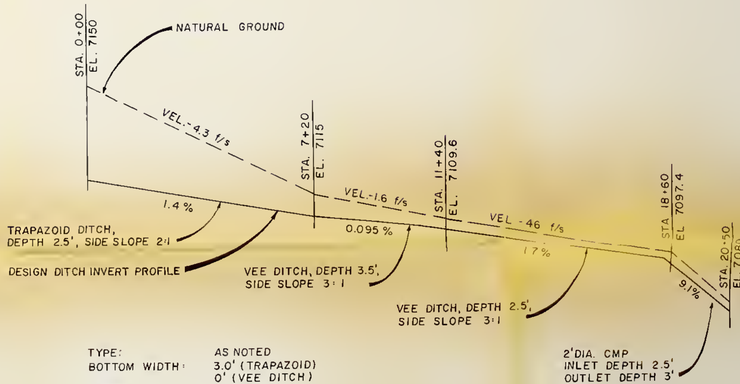


TYPE:	VEE DITCH AS NOTED
BOTTOM WIDTH:	0' (VEE DITCH) 3.0' (TRAPAZOID)
DEPTH:	AS NOTED
SIDE SLOPE:	AS NOTED
DISCHARGE:	10 cfs (STA. 0+00 TO STA. 9+50) 20 cfs (STA. 9+50 TO STA. 29+80) 42 cfs (STA. 29+80 TO STA. 80+80)

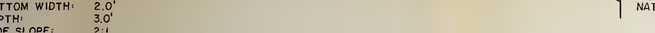
DITCH L1

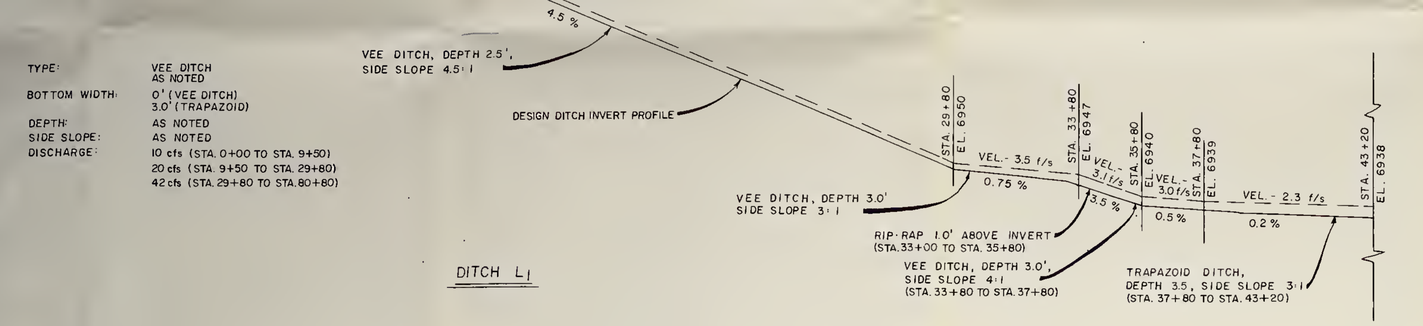


TYPE:	TRAPAZOID
BOTTOM WIDTH:	2.0'
DEPTH:	3.0'
SIDE SLOPE:	2:1



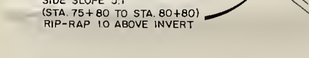
TYPE:	AS NOTED
BOTTOM WIDTH:	3.0' (TRAPAZOID) 0' (VEE DITCH)
DEPTH:	AS NOTED
SIDE SLOPE:	AS NOTED
DISCHARGE:	10 cfs (STA. 0+00 TO STA. 7+20) 20 cfs (STA. 7+20 TO STA. 11+40) 42 cfs (STA. 11+40 TO STA. 20+50)

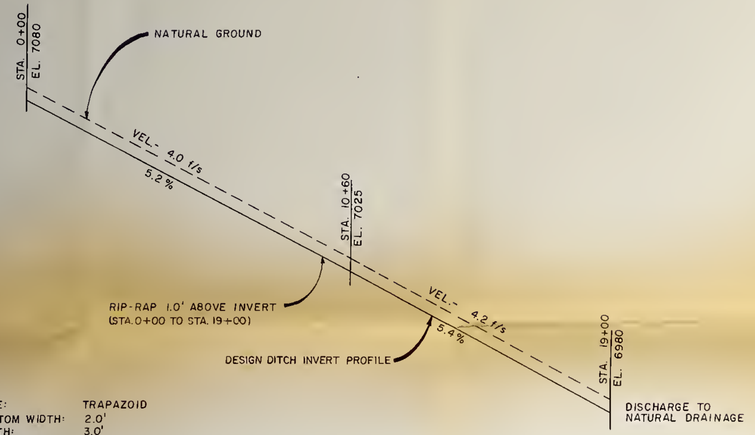




TYPE:	VEE DITCH AS NOTED
BOTTOM WIDTH:	0' (VEE DITCH) 3.0' (TRAPAZOID)
DEPTH:	AS NOTED
SIDE SLOPE:	AS NOTED
DISCHARGE:	10 cfs (STA. 0+00 TO STA. 9+50) 20 cfs (STA. 9+50 TO STA. 29+80) 42 cfs (STA. 29+80 TO STA. 80+80)

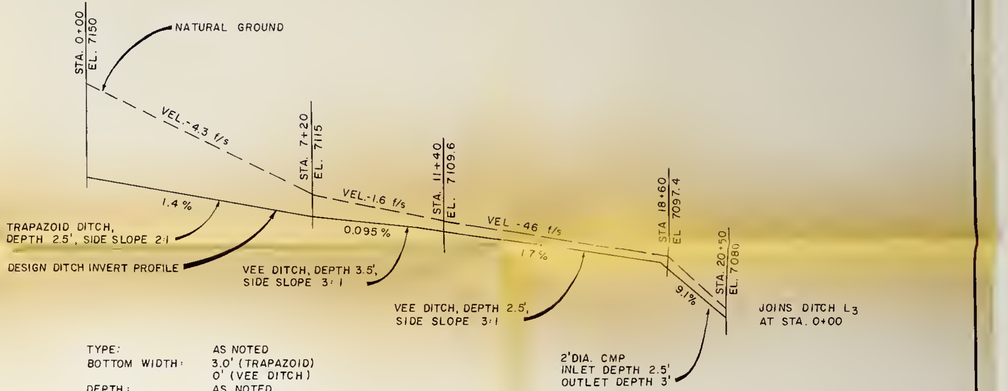
DITCH L1





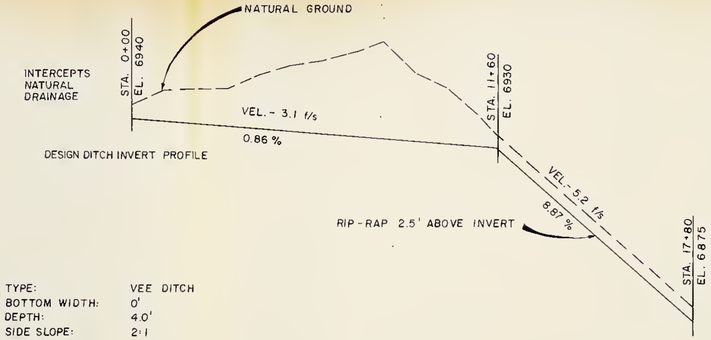
TYPE:	TRAPAZOID
BOTTOM WIDTH:	2.0'
DEPTH:	3.0'
SIDE SLOPE:	2:1
DISCHARGE:	42 cfs

DITCH L3



TYPE:	AS NOTED
BOTTOM WIDTH:	3.0' (TRAPAZOID) 0' (VEE DITCH)
DEPTH:	AS NOTED
SIDE SLOPE:	AS NOTED
DISCHARGE:	35 cfs

DITCH L2



TYPE:	VEE DITCH
BOTTOM WIDTH:	0'
DEPTH:	4.0'
SIDE SLOPE:	2:1
DISCHARGE:	42 cfs

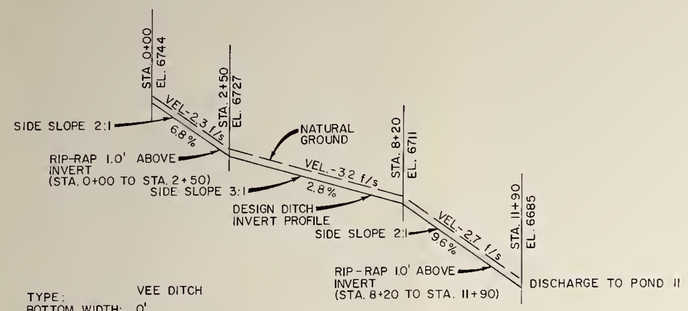
DITCH L4

RIO BLANCO OIL SHALE COMPANY
RIO BLANCO COUNTY, COLORADO

DITCH PROFILE

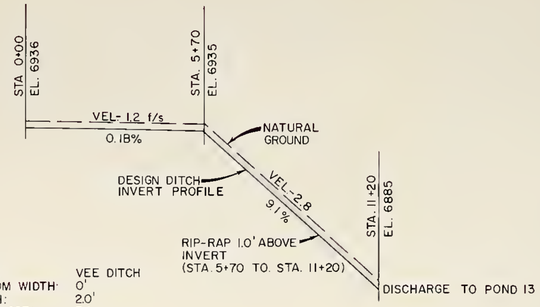
DRAWN BY T.J.N.	DATE 12/8	SCALE 1"=20' V, 1"=200' H.	EXHIBIT No. G-11
APP'D. BY	DATE	DATE 12/80	
DESIGN BY T.P.H.	DATE	DWG No. SHT 4 OF 5	
APP'D BY			

MORRISON - KNUDSEN CO., INC.



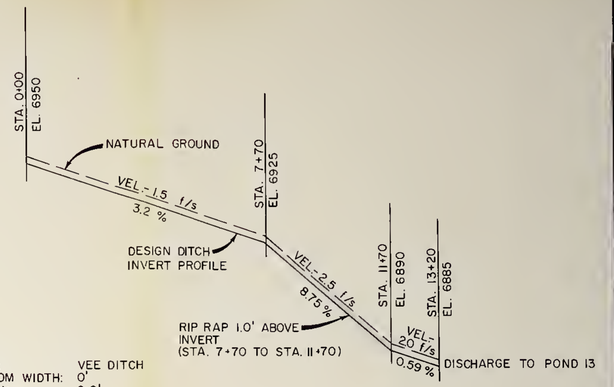
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 2.0'
SIDE SLOPE: AS NOTED
DISCHARGE: 35 cfs

DITCH N_1



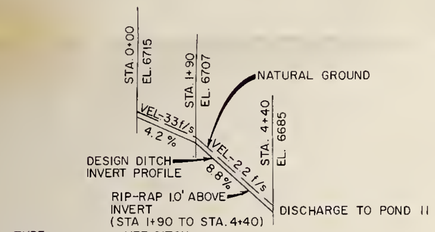
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 2.0'
SIDE SLOPE: 3:1
DISCHARGE: 4.1 cfs

DITCH L_5



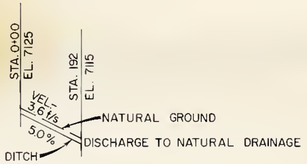
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 2.0'
SIDE SLOPE: 3:1
DISCHARGE: 4.9 cfs

DITCH L_6



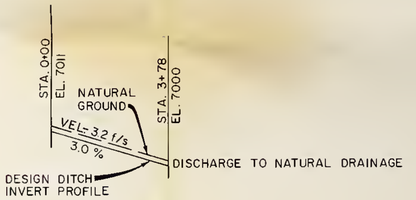
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 2.0 cfs

DITCH N_2



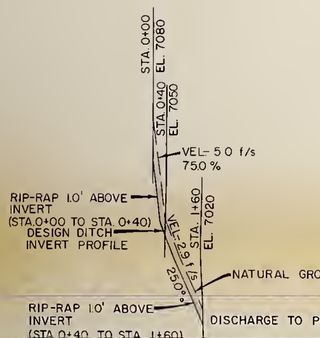
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 2.5 cfs

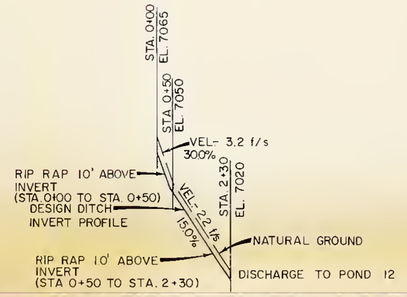
DITCH M_1



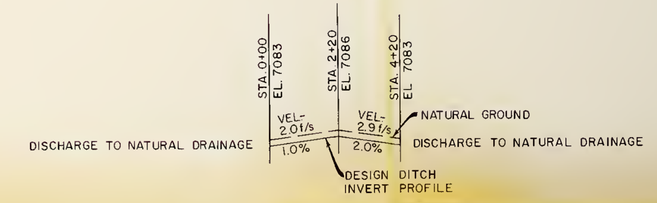
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 2.7 cfs

DITCH M_2

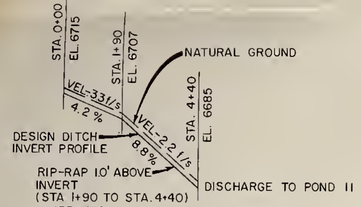




TYPE VEE DITCH
BOTTOM WIDTH 0'

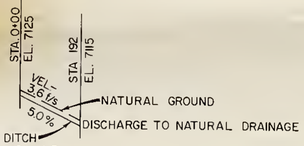


TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 2.0'
SIDE SLOPE: 3:1
DISCHARGE: 2 cfs



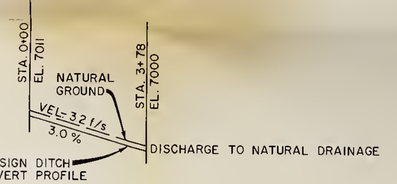
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 2.0 cfs

DITCH N_2



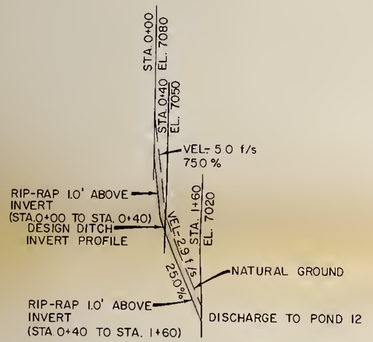
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 2.5 cfs

DITCH M_1



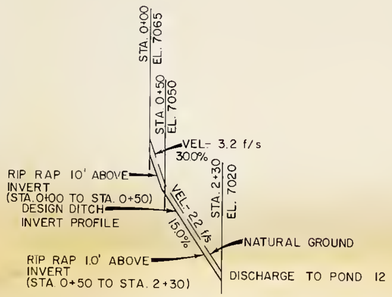
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 2.7 cfs

DITCH M_2



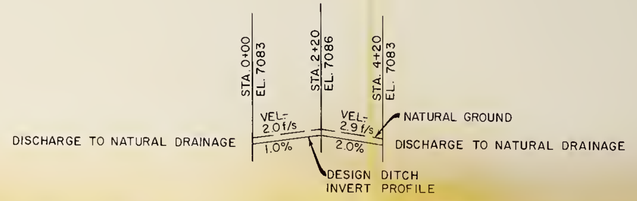
TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 1.0 cfs

DITCH P_1



TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 1.5'
SIDE SLOPE: 3:1
DISCHARGE: 1 cfs

DITCH P_2



TYPE: VEE DITCH
BOTTOM WIDTH: 0'
DEPTH: 2.0'
SIDE SLOPE: 3:1
DISCHARGE: 2 cfs

DITCH P_3

RIO BLANCO OIL SHALE COMPANY
RIO BLANCO COUNTY, COLORADO

DITCH PROFILE

DRAWN BY: B.R.M	DATE	SCALE: 1"=20' V.; 1"=200' H	EXHIBIT NO. G-12
APP'D. BY:		DATE: 12/80	
DESIGN BY: J.P.O	DATE	DWG. NO. SHT. 5 OF 5	
APP'D. BY:			

MORRISON-KNUDSEN COMPANY, INC.
MINING GROUP / BOISE, IDAHO

ROFILE